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ABSTRACT

The Media and Technology section of this collection of conference presentations contains the following 10 papers: "Carpooling on the Information Superhighway" (Lorna Veraldi); "New Media Departure in 'The Principle of Relative Constancy': VCRs" (Ghee-Young Noh); "Why the Western Design Approach Does Not Work for Asian Language Computers" (Virginia Mansfield-Richardson); "Cross-Media Response to Digital Manipulation of the Still and Moving Images" (George Albert Gladney and Matthew C. Ehrlich); "Over Their Heads: The Plan to Use Satellites to Broadcast High-Definition Television" (Brad Thompson and Robert Trager); "Decision-Making through Computer-Mediated Communication Systems in Organizations" (Linlin Ku); "Synchronous and Asynchronous Forums in Cyberspace for Theoretical Dialectic" (Joseph M Kayany and Michael W. Rowley); "Does the Sun Shine in Cyberspace? Electronic Access and State Open-Meetings Laws" (William J. Leonhirth); "Play Theory and the News Content of Interactive Media" (Jane B. Singer); and "A Theoretical and Normative Approach to National Information Infrastructure Policy" (Richard J. Schaefer). (RS)

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CARPOOLING ON THE INFORMATION SUPERHIGHWAY

A Paper Presented to
the Communication Technology and Policy Division

AEJMC

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August 10, 1994

CARPOOLING ON THE INFORMATION SUPERHIGHWAY

Abstract

When the FCC in 1975 adopted rules barring local cross-ownership of newspapers and television stations, it did so on the theory that such rules would encourage diversity of opinion and the free flow of ideas. Twenty years later, those same rules may instead impede development of new information technologies. There was never compelling evidence supporting the cross-ownership rules. It's high time for their repeal in the interests of encouraging newspapers and television stations to "carpool" on the information superhighway.

CARPOOLING ON THE INFORMATION SUPERHIGHWAY

> Newspaper reporters sporting high-8 cameras competing with television news organizations? That scenario is not here yet, but it may be soon. [1]

So began a piece headlined "Look for television in tomorrow's newspaper" in Broadcasting & Cable about a year ago. The story went on to summarize television-related developments in the print world.

By spring 1993, some reporters at Knight-Ridder were using high-8 cameras for still photography. The images are "coarser" than normal print photographs. However, "[i]f technology currently being tested in Boulder, Colo., makes it to the product stage, those Knight-Ridder reporters could be shooting full-motion video for a newspaper downloaded via cable TV systems."[2]

Just what is being tested in Boulder?

> The product being developed at Knight-Ridder's Information Design Laboratory is a newspaper "tablet" similar to a computer notebook weighing just over one pound. The tablet could be plugged into a communications "dock" such as a cable hook-up, and loaded with the latest edition of one or more publications, then removed and read later.
>
> The reader could interact with the tablet screen, touching a story summary to get the full text, pressing an advertisement to get more information on the product, enlarging the type, developing a customized index of stories or "clipping" a story electronically. The news could be delivered as print, audio or even full-motion video.[3]

Roger Fidler, the tablet's designer, said he expects a full test of the tablet by 1995. But Fidler warned that cost, capacity and transmission time will be barriers to widespread use of the tablet "for some time."[4]

As I read about the tablet newspaper of the future, I was struck by how far technology has come, and how quickly. I also was struck by how far we have yet to travel--as Fidler conservatively estimated the speed with which the newspaper "tablet" will achieve widespread use. And I was reminded how often technology and the marketplace race ahead of the law and policy of another era. Indeed, as often as not law and policy hamper progress.

The technological borders that once separated newspapers from television are fast disappearing. Partnerships between these two major sources of local news might help both prosper in a world of new television competitors and shrinking newspaper readership. Newspapers and television stations could carpool on the information superhighway, sharing product and dividing the cost of developing hardware. Yet federal regulations prohibit such partnerships, on grounds that seem increasingly untenable.

And while it seems like only yesterday that the Federal Communications Commission adopted rules barring cross-ownership of newspapers and television stations in the same market, in truth it's well past time for those rules to go.

Methodology

This study will trace the adoption of the FCC's newspaper-broadcast cross-ownership rules. It will examine the basis for the rules. It will look at changes in technology and economics since the adoption of the cross-ownership rules. And it will suggest why the rules now seem ripe for repeal.

The FCC's 1975 newspaper-broadcast cross-ownership rules make owners of daily newspapers ineligible to build or buy radio or television stations whose specified service contours encompass the city in which the newspaper is published.[5] They prohibit renewal of broadcast licenses to parties who acquire co-located dailies.[6] In addition, when the FCC adopted the rules, it required divestiture of print or broadcast properties in sixteen communities where the publisher of the only daily newspaper owned the only local radio and/or television station(s) and no substantial news programming reached the community from another market.[7]

However, the FCC left most newspaper-broadcast combinations intact. Less-than-monopoly combinations were grandfathered in unless they were subsequently sold or denied license renewal on grounds of anticompetitive abuses violating the Sherman Act.[8]

One might presume that the FCC found convincing evidence of something wrong with local newspaper-broadcast cross-ownership before banning it. Yet the same rules that banned any prospective cross-ownership did nothing to break up most existing combinations. If cross-ownership was an evil, why didn't the Commission do away with all existing combinations? On the other hand, if cross-ownership did no harm, why did the Commission order even a few co-located properties to be sold and prohibit all future combinations? From the beginning, the rules were controversial--inconsistent and vulnerable to challenge both for what they tried to do and for what they failed to do.

The Origin of the Cross-Ownership Rules

What prompted the adoption of the 1975 newspaper-broadcast cross-ownership rules? Did the Commission act after gathering substantial evidence of abuse by broadcast licensees who owned daily newspapers in the same markets? That seems not to have been the case. The push for cross-ownership rules, if anything, may have been politically motivated. It appears, at least in part, to have been an attempt by government to limit the power of an adversarial press--using First Amendment and antitrust theory, rather than fact, to fashion an argument against newspaper-broadcast cross-ownership.

Whatever the behavior of individual licensees, concentration of ownership has been presumed undesirable in a nation at least sentimental about encouraging a competitive ideological and economic marketplace. Over the years the FCC has implemented a number of rules limiting ownership of broadcast stations in the name of promoting diversity of ownership both locally[9] and nationally.[10] During the 1960s, when both ends of the political spectrum had declared war on some nebulous monolith called "big media,"[11] the Commission found support for limits on newspaper-broadcast cross-ownership in conventional wisdom. The Commission's cross-ownership rules arose as much from popular presumptions about the influence of "media barons,"[12] as from any convincing evidence of abuse.[13]

There had been concern over newspaper ownership of broadcast stations for almost half a century before the FCC adopted rules banning local newspaper-broadcast cross-ownership. When the Congress debated the Radio Act of 1927, there were questions about the fairness of allowing one newspaper in a city to own a radio station if rival newspapers did not. But the debate was not over whether newspaper ownership of radio would diminish diversity of news sources. At the time radio was seen not as a news competitor, but as a means of promoting the licensee's newspaper business. Giving one newspaper a license, it was argued, would unfairly disadvantage print rivals in what were then cities with fiercely competing dailies.[14]

During the Great Depression, there was a rapid decline in competitive daily newspapers and a rapid expansion of newspaper owners into broadcasting. Congress began to pressure the FCC to consider limits on newspaper-broadcast cross-ownership.[15]

Then, in a dissent to a 1936 licensing decision, FCC Commissioner Irvin Stewart urged his colleagues "squarely" to face the issue of whether licensing a broadcast station to a newspaper publisher served the public interest, convenience and necessity.[16]

In 1938 the FCC did so, ordering its Engineering Department to study newspaper-broadcast cross-ownership. The Engineering Department, however, reported back that it had found too much variety in newspaper-radio combinations to recommend any general rule against cross-ownership.[17]

The 1941 Newspaper Inquiry

In March 1941, despite the contrary recommendations of its Engineering Department, the FCC undertook a rulemaking aimed at limiting newspaper ownership of broadcast stations.[18] All applications filed by newspaper owners for construction permits or approval of station purchases would be kept on hold until the FCC decided whether it should adopt such a rule.

Why did the FCC go ahead with the rulemaking despite its own staff's recommendation against such a move only three years before? Several factors may have prompted the Commission to act. First, FM and television were under development, and newspaper publishers were investing heavily in both. The Commission may have worried that it would have to make numerous licensing decisions involving applications by newspaper owners for the new services and wanted to have some general policies on which to base its decisions. More important, perhaps, President Franklin Roosevelt was reportedly disturbed by the way some newspapers were covering him. Roosevelt had been severely criticized by major newspapers during his 1940 re-election campaign; a majority of publishers had endorsed his opponent. It was rumored he was unhappy with what he considered efforts to sabotage his fireside chats by powerful newspaper-owned radio stations in the Midwest.[19]

Under pressure from the White House, the FCC may have been trying to force the Congress to act on this politically hot topic. Earlier opinions of an FCC staff attorney and the federal courts suggested that the FCC had no authority to prohibit newspaper ownership of broadcast stations unless Congress amended the Communications Act of 1934.[20]

Newspaper publishers protested the FCC's 1941 inquiry. They argued the Commission had no power to bar newspapers from owning broadcast stations. The American Newspaper Publishers' Association unsuccessfully petitioned the FCC to end the inquiry. A Tennessee publisher refused to testify at FCC hearings on the inquiry until a federal court ordered him to appear. Upholding the Commission's right to conduct an investigation and to call witnesses, the Court of Appeals for the District of Columbia, while ordering the publisher to appear and testify, warned the FCC that it did not have the power under the Communications Act to exclude newspaper publishers as a class from broadcasting.[21]

The FCC's hearings in the 1941 Newspaper Inquiry continued intermittently for more than a year. Extensive testimony concerned Constitutional problems that would be raised by a general rule excluding newspaper publishers from obtaining licenses. Such a general exclusion, it was argued, would violate First Amendment guarantees of freedom of the press.[22]

Moreover, there was little evidence of widespread abuse by commonly owned newspapers and radio stations. The FCC sent investigators into communities to look for news bias. A similar study was independently conducted under the auspices of Columbia University. The only real problem that either found was that in some small towns newspapers that owned radio stations refused to print the program schedules of rival stations.[23] Ultimately, in January 1944, the FCC closed the record and dismissed the proceedings without adopting any cross-ownership rules.[24]

The first job the FCC had was clearing the backlog of applications left pending while it conducted its Newspaper Inquiry. In the Commission's decisions in these cases, cross-ownership seemed to be a decisive comparative factor only when there was no other basis to find one applicant superior.[25] For thirty years thereafter, the FCC continued to license stations to co-located newspaper owners.

During the television station licensing gold rush of the 1950s, the FCC said its policy was to disqualify a newspaper publisher from consideration for a license in the same town only if the publisher had a history of anticompetitive behavior.[26] However, at least one critic of FCC licensing practices during the 1950s suggested licensing decisions concerning newspaper applicants often hinged on a publisher's politics, rather than any consistent FCC policy or finding of anticompetitive abuse.[27]

Newspaper-Broadcast Cross-Ownership Revisited

It was not until 1970 that the FCC, then headed by Nixon appointee Dean Burch, revisited the issue of newspaper ownership of broadcast stations in a general rulemaking. The renewed interest in cross-ownership came as part of a wide-ranging Commission revision of ownership rules. The Commission's duopoly rule already prohibited the same licensee from owning more than one station in the same service--AM, FM or TV--in the same community.

In 1970 the Commission adopted a new one-to-a-market rule banning future combinations of AM, FM and/or TV in the same community.[28] The rule was not so much to foster economic competition as to promote programming diversity.[29]

> We are of the view that 60 different licensees are more desirable than 50, and even that 51 are more desirable than 50. In a rapidly changing social climate, communication of ideas is vital. If a city has 60 frequencies available, but they are licensed to only 50 different licensees, the number of sources for ideas is not maximized. It might be the 51st licensee that would become the communication channel for a solution to a severe local social crisis. No one can say that present licensees are broadcasting everything worthwhile that can be communicated. We see no existing public interest reason for being wedded to our present policy that permits a licensee to acquire more than one station in the same area.[30]

The FCC's renewed interest in diversity came once again at a time when the White House expressed suspicions about the fairness of the press. More than once during his political career, Richard Nixon had criticized the press for what he considered hostile treatment. Now, with Vice

President Spiro Agnew as point man, the Nixon administration was taking on the media with new vigor. However, support for more stringent ownership controls came not just from Nixon's FCC Chairman, Dean Burch, but from outspoken liberal Democrat Nicholas Johnson, a Lyndon Johnson appointee.

Chairman Burch questioned the need for the one-to-a-market rules. He said the real reason for a lack of local diversity was newspaper-television cross-ownership.

> In the Washington metropolitan area there are 37 aural services: in New York, 59: in Chicago, 61, and so on. There is a plethora of aural services in all significant markets. Thus, while separating TV from AM or FM might make a contribution in a few cases, it is clearly far from the heart of the problem. The plain fact is that the Commission has labored for over two years, received reams of comments, heard extensive argument, only to bring forth a rule which applies to areas of ownership least needing attention, if at all.
>
> Clearly, the media cross-ownership matter warranting the most attention is that of VHF-TV and the daily newspaper. There are only a few daily newspapers in each large city and their numbers are declining. There are only a few powerful VHF stations in these cities, and their numbers cannot be increased. Equally important, the evidence shows that the very large majority of people get their news information from these two limited sources. Here then is the guts of the matter. As far as I am concerned, if there is any threat of undue concentration, and I have of course reached no final conclusion on this score, it does not lie in cross-ownership of AM-FM-TV.
>
> . . . Let's face up to the fact that if we are going to inquire into concentration, we should have started at the most obvious point.
>
> I have heard. . . views concerning the stability of the newspaper owner--that such an owner does not "traffick" and does a better job of serving as an outlet for local expression. These factors and many others have to be explored in the proceeding, and, as I stressed, I remain openminded on the issue. My point here is simply that that is the issue.

> . . . . I join in that portion of the action which looks belatedly to consideration of the heart of this problem. . . .[31]

The belated action to which Burch referred was the proposal issued by the Commission when it adopted the one-to-a-market rule to prohibit cross-ownership of daily newspapers with broadcast stations in the same community. The Commission also proposed to require sweeping divestiture to split up all existing local newspaper-broadcast combinations.[32]

The Commission noted that the Antitrust Division of the Department of Justice had been influential in proceedings leading to the adoption of the one-to-a-market rule. The Antitrust Division would continue to make its influence felt, in innovative and controversial ways, as the Commission considered the proposed newspaper-broadcast cross-ownership ban.

Antitrust Division License Challenges

After the Commission proposed cross-ownership rules in 1970, it all but let the proposal die. By the spring of 1974, the five Commissioners who had expressed strongest sympathy for cross-ownership rules (Nick Johnson, Dean Burch, Kenneth A. Cox, H. Rex Lee and Robert Bartley) all had left the FCC.

The Antitrust Division of the Department of Justice had encouraged the FCC to adopt proposals limiting newspaper ownership of broadcast stations in comments filed when the rulemaking was announced.[33] When the proposal languished in the early 70s, the Antitrust Division was instrumental in reviving it. To force the Commission to get on with its rulemaking, the Antitrust Division embarked on a series of challenges to license renewal of stations cross-owned with daily newspapers in selected markets--using a hybrid public interest-antitrust law argument.[34]

While the Commission was not persuaded that it should deny any of the challenged license renewals, the petitions filed by the Antitrust Division had their anticipated effect. The Commission activated its 1970 newspaper-broadcast cross-ownership rulemaking. With Antitrust Division petitions to deny pending in four markets, the Commission held oral arguments on the proposals in the summer of 1974.[35] Before the Commission adopted its rules in 1975, the Antitrust Division, keeping the pressure on, would challenge license renewals of nine newspaper owners in all.[36]

As when the FCC considered rules on newspaper-broadcast cross-ownership thirty years earlier, during its 1941 Newspaper Inquiry, written comments and hearings on the 1970 cross-ownership proposal produced no conclusive evidence of harm or benefit resulting from newspaper-broadcast cross-ownership. The Commission considered four major questions:

(1) In the absence of rules on newspaper-broadcast cross-ownership, how concentrated had the ownership of newspapers and broadcast stations become? To what degree could diversity of media ownership be expected to increase or decrease if proposed rules were adopted--or, alternatively, if they weren't?

Elaborate attempts were made to measure the existing degree of media concentration or diversity. Three studies commissioned by the broadcast industry indicated that a mindboggling array of competitors hawked their media wares in every American market,[37] and that, even in the absence of rules, cross-ownership had declined and would continue to decline.[38] Critics countered that any decline in cross-ownership reflected merely an increase in the total number of broadcast stations and that lists of diverse media available to most Americans were inflated in light of the limited degree to which national media provide local news and advertising alternatives.[39] In the end, the Commission was unimpressed by the industry's media "counts," which it found relatively useless.[40] On the other hand, proponents of divestiture failed to convince the Commission that there was an "urgent" need to break up most existing newspaper-broadcast combinations.[41]

(2) What would be the likely consequences of a divestiture order?

Two studies filed by the newspaper industry predicted that ordering publishers to divest themselves of broadcast stations they had acquired prior to the rulemaking would severely reduce the market value of affected properties and the number of locally owned broadcast stations.[42] Other testimony indicated that even across-the-board divestiture would not significantly increase the total number of potential media sales or glut the market in media properties.[43] Even though the Commission decided to frame its divestiture order narrowly to avoid working undue hardship on existing licensees, it concluded that pessimism about the consequences of more extensive divestiture was probably exaggerated.[44]

(3) What was the effect, if any, of newspaper-broadcast cross-ownership on advertising rates?

Two studies were submitted purporting to show the effects of newspaper-broadcast cross-ownership on local advertising rates. They cancelled each other out. The first concluded that, other factors being equal, newspaper-television cross-ownership increased newspaper flat line ad rates by ten percent and television prime time rates by fifteen percent.[45] The second study attacked the methodology used in conducting the first and found cross-ownership had no effect on advertising prices.[46] The Commission was unable on the basis of these two conflicting studies or its own research[47] to reach any conclusion on the impact of cross-ownership on advertisers.

(4) What effect, if any, did newspaper-broadcast cross-ownership have on media content--particularly on coverage of local news and public affairs?

More testimony, much of it anecdotal, was offered about cross-ownership's effect on content than on any other issue.[48] Broadcasters--sensitive to the FCC's concern with diversity of viewpoints and news sources--took pains to prove that they insulated broadcast news operations from commonly owned newspapers.[49] Citizen groups, on the other hand, complained of abuses and failures of cross-owned media.[50] Empirical studies of the effects, good and bad, of newspaper cross-ownership on the quality and quantity of broadcast programs were submitted, but they were inconclusive.[51] The Commission concluded neither that newspaper-broadcast cross-ownership enhances nor that it inhibits news coverage or that newspaper owners are better or worse public trustees than other broadcasters.[52]

The FCC concluded its fact-finding with evidence "substantial" enough under federal law to support almost any decision.[53] However, it found no convincing evidence that local newspaper-broadcast cross-ownership had resulted in widespread harm. Nonetheless, the FCC decided that it had to do something. It concluded that "even a small gain in diversity" justified cross-ownership rules.[54] So it adopted a total prohibition on future licensing of broadcast stations to those who published daily newspapers in the same market. At the same time, the FCC decided to grandfather in existing cross-owned combinations in all but the most "egregious" cases.[55] It ordered divestiture of broadcast or newspaper operations only in a few small markets where the same owner owned the only daily newspaper and the only radio and/or television stations. (Skeptics suggested that these were also markets where owners could make the most convincing arguments for a waiver of the divestiture order, given the likely lack of interested buyers for either the newspapers or broadcast stations in these tiny markets.)[56] Given the lack of compelling evidence supporting any general cross-ownership rule, had the Antitrust Division not been breathing down the FCC's neck in renewal proceedings, perhaps the FCC would have ended the rulemaking as it had the 1941 Newspaper Inquiry--with no action at all.

It seemed illogical that the same set of facts that might have justified either a total prospective ban or only very limited divestiture could possibly have justified both. The rules were challenged and the Court of Appeals ordered the FCC to adopt a general divestiture order consistent with its total prospective ban.[57]

However, the United States Supreme Court in 1978 upheld the FCC's apparent inconsistencies and overruled that part of the Court of Appeals' decision that would have required broader divestiture.[58] The Supreme Court held that where an agency decision is "primarily of a judgmental or predictive nature. . . . complete factual support in the record. . . is not possible or required."[59] In other words, the Commission was free to reach inconsistent conclusions on the basis of the same set of predictions and, if expedient, to adopt them all.

Given the Commission's broad discretion in issuing licenses, it did not exceed its authority by adopting rules aimed at maximizing diversification of control of mass media, of which the broadcast frequencies it licenses are only one element.[60] The Commission might have no authority to discriminate against newspaper publishers as a class.[61] However, nothing prevented the FCC from treating newspaper owners as it might other media owners whose combined holdings might restrict the free flow of competitive ideas in a given local marketplace. The cross-ownership ban did not unconstitutionally single out newspaper owners for discriminatory treatment. It simply subjected them to the same kinds of restrictions as faced existing broadcast licensees under the FCC's duopoly or one-to-a-market rules.[62]

Moreover, the Supreme Court ruled, in promoting diversity of media ownership the FCC was trying to promote freedom of expression, not to abridge it.[63] The FCC, concluded the Supreme Court, had violated neither its statutory limits nor the Constitutional rights of newspaper owners or broadcasters in adopting the cross-ownership rules.

The Case for Repeal of the Cross-Ownership Rules

Much has changed since the Supreme Court in 1978 upheld the cross-ownership rules in 1978. Some speculate that the Supreme Court might decide the case differently today.[64] However, even presuming the legal underpinnings of the cross-ownership rules are as firm today as they were in 1978, there are still good reasons for the FCC's newspaper-broadcast cross-ownership rules to go.

Evidence supporting the rules was never compelling. But at the time they were adopted, it was equally hard to show that they would do any real harm. However, now the rules stand as a roadblock in the information superhighway. As newspapers and television stations carve out a competitive niche in the coming information marketplace, the societal benefits of encouraging local news outlets to pool resources and invest in innovations far outweigh the potential of newspaper-broadcast cross-ownership for harm.

Twenty years ago, no newspaper publisher could have argued that the same reporters that appeared on its television station might also "appear" in its multimedia newspaper pages. Nor could a publisher have shown that the same video cameras that supplied pictures for its television station newscasts could also supply full motion video for its newspaper "viewers." It was hard to make a convincing argument for economies of scale that resulted from owning two news operations in the same market when the lines between those two operations seemed so distinct. And indeed, licensees who owned both newspapers and stations in the same market were eager to prove just the opposite, to avoid aggravating then popular concerns that cross-ownership reduced diversity of opinion and information. One witness at the 1974 FCC hearings put it rather cynically: "It seems to me the editorialists for the newspaper and editorialists for the TV station have to be aware that if they don't come up with some different positions, the ownership is not going to have them to cite to this Commission."[65] Another witness, taking a more practical than conspiratorial view, pointed out that "techniques and approaches [of television and newspapers] . . . are so different there could be no common management."[66] Proponents of the rules in 1974 were quick to point out that licensees could hardly claim that they were better licensees because they owned newspapers at the same time they claimed that the news operations of the two were distinct. "If you don't share reporters and you don't consult and you don't have an integrated operation, if it is really separate, you are not going to have joint economies."[67]

Today, both the political climate and technology have changed markedly. It is now possible to conceive of combining some of the most expensive aspects of news gathering and production for the television stations and newspapers of tomorrow. The ability to equip and pay a single integrated news staff to produce local news for multiple uses could mean the difference between extinction and survival for some newspapers and television stations. For others, it might encourage better, more comprehensive news coverage, in part by eliminating some of the wasteful duplication that comes of sending multiple reporters and crews to the same story.

There's no question that the cross-ownership rules have substantially reduced the number of co-located newspaper-broadcast combinations. In 1973, before the rules went into effect, over sixteen percent of broadcast stations were owned by the publishers of co-located newspapers. In a little more than a decade after adoption of the cross-ownership rules, the percentage of broadcast stations with local newspaper affiliations had declined to about four percent.

Nationally, however, the number of television-newspaper affiliations increased over the same period--from less than 21% in 1973 to almost 29% by 1988. Despite the ban on local combinations, owning both print and broadcast has increased over the years since the cross-ownership rules went into effect. Thus, two significant trends have emerged: a steady increase in overall cross-ownership of newspapers and television and a marked decline in local cross-ownership of daily newspapers and television.[68]

The marked decline in local cross-ownership is easy enough to explain; the FCC in 1975 banned the creation of new combinations and forbade the sale of existing combinations. But why the national trend toward more cross-ownership?

As is graphically illustrated by reports of newspaper photographers armed with video cameras, it makes sense in a world of converging technologies to look beyond technology in defining one's business. A company in the business of providing news and selling advertising used to identify itself along technological lines. It printed newspapers. It published magazines. It made newsreels. It produced news broadcasts for radio, television or, eventually, cable. Even if it did all of those things, it did them through separate divisions or operations whose interests rarely collided.

The media world is changing. Walt Disney labels itself a "software" company now. Like many other producers of entertainment, Disney is looking beneath the technology of film or television or computer programs to the underlying substance of what it does and, more important, what it envisions itself doing in the coming century.

So it is, and so it should be, with companies in the business of collecting and disseminating local news. It might be tempting to think that we can create by government fiat multiple dailies competing with multiple television stations in the same market--and that this would increase diversity of opinions and information. The economic fact is that few markets now support competing dailies, and they are not likely to resurge.[69] Given the uncertain future of broadcasters on the information superhighway, improved local news and public affairs programming is more likely if stations are allowed to explore the increased economies that result from multiple uses of their local news product.

Such economies are exemplified by the recent creation of local news channels as a result of retransmission consent negotiations under the 1992 Cable Act. Few broadcasters were able to bargain for cash payments in return for cable's retransmission of their signals. However, a fair number have bargained for cable channels on which to air expanded local and regional news.

One such channel, for example, will be operated by a Spokane, Washington broadcaster whose properties include KXLY-TV, KXLY(AM) and KXLY-FM and who will now add KXLY extra!, a local cable channel, to its line-up. The cable channel will serve not just Spokane, but also approximately 16,000 additional households in such small northern Idaho towns as Coeur d'Alene and Post Falls--towns too small ever to support their own television stations. In addition to simulcasts and rebroadcasts of KXLY-TV news programs, KXLY extra! will provide news and talk programs originating on KXLY(AM) and KXLY-FM and expanded local and regional news coverage specifically designed for rural north Idaho and not included in any of its metropolitan Spokane broadcasts.[70]

Other such local news expansions include: a regional news service to be put together by four Pacific Northwest stations owned by the Providence Journal; a news and talk channel planned for San Francisco by Chronicle Broadcasting; and news channels that Cox (Pittsburgh, Charlotte, N.C., Orlando, Florida and Atlanta) and Times Mirror (Dallas, Austin, St. Louis and Birmingham, Alabama) are trying to start up in their respective broadcast markets.[71] Would it be better if such regional news services were independently owned and competitive with existing broadcasters? Perhaps. But it seems unlikely that independent operations would find it profitable to start up, especially in the smallest markets.

It might be pleasant to reminisce about the "lonely pamphleteer" as the embodiment of First Amendment ideals. But lonely pamphleteers--and small newspaper and broadcast owners--will not be able to afford futuristic technologies or extensive single-use newscasts. Even companies the size of Knight-Ridder are conservative in their estimates of how soon experiments with multimedia tablets will translate into profits. But it is only large companies that can support the kind of research and development in which Knight-Ridder is currently engaged. Feeding and refeeding video to co-located newspapers and television stations could give companies the incentive and resources to experiment with new technologies. In 1994 local newspaper-television combinations, unlike their predecessors in 1974, might well produce better local video news because of growing opportunities for them to market that news via multiple media.

Broadcasters face daunting costs if they are to stay competitive. Right now, if the FCC continues on its projected schedule for the transition to HDTV, broadcasters must find ways of multiplying revenue sources so they can afford to make substantial investments in new technologies. If the national trend toward more cross-ownership is evidence, allowing local newspaper-television cross-ownership may encourage better local service by rewarding production of local news with increased savings from multiple uses of the same production resources.

If there had been good reason to adopt the cross-ownership rules in 1975--evidence of widespread news manipulation or price fixing by co-owned dailies and television stations--there would be good reason to hesitate before abandoning those rules. However, nothing in the record in either of the FCC's two extensive inquiries into the effects of cross-ownership proved cross-ownership led to abuses.

On the contrary, if the concern is encouraging freedom of expression, it is disturbing that rules to prevent newspaper owners from obtaining broadcast licenses seem to have been motivated in part by politicians' desires to weaken the press, rather than from a genuine concern about the free flow of information. Never was that more apparent than in 1988, when the FCC's attempts to reconsider and perhaps repeal its cross-ownership rules were blocked by Congress. Senator Edward Kennedy's motivation in introducing legislation to prevent the FCC from repealing the cross-ownership rules apparently was to make sure Rupert Murdoch was forced to sell the Boston Herald, co-owned with Fox's Boston Channel 25. Under Murdoch's ownership, the Herald had been harshly critical of Kennedy.[72] The inclination of liberal and conservative politicians alike, from Roosevelt to Nixon, to try to use FCC licensing to muzzle perceived media enemies is one good reason to do away with FCC licensing rules that limit the power of the press.[73]

Recent action by both the Congress and the FCC indicates that the time is ripe for repeal of the cross-ownership rules. In October 1993, Congress cleared the way for the FCC to institute a liberal waiver policy concerning newspaper-radio cross-ownership. The new law would allow the FCC, if it finds that the public interest will be served, to grant cross-ownership waivers in the top 25 markets, provided that at least 30 independent broadcast voices remain after the waiver. The House-Senate conference committee that recommended the changes "was swayed by rapid changes in the media world that have decreased concerns about undue concentration involving newspapers and radio stations."[74]

The FCC, now more concerned with the economic viability of broadcasters than it needed to be twenty years ago, has liberalized its multiple ownership rules to increase the number of stations a single licensee can own and to allow radio duopolies. In 1993, the FCC for the first time granted a permanent waiver of the newspaper-television cross-ownership rule to allow Rupert Murdoch to regain control of the New York Post. Murdoch was forced to sell the Post in 1988 after Fox Television became the licensee of New York station WNYW, but his successors couldn't keep the Post afloat.[75] Perhaps struggling newspapers like the Post are more likely to succeed when linked to local television operations--in an age when local news operations, print and broadcast, have more in common than ever before.

Allowing newspapers and broadcast stations to form local partnerships may help insure their survival and give them added incentive to invest in new technologies and better local news coverage. Encouraging newspapers and television stations to carpool could speed both onto the information superhighway of tomorrow.

NOTES

1. Geoffrey Foisie, Look for television in tomorrow's newspaper, Broadcasting & Cable, Apr. 19, 1993, 72.

2. Id. at 74.

3. Id.

4. Id.

5. The degree to which a broadcast station's signal is subject to fading and interference is expressed in terms of a station's service area. Thus, the FCC's ownership rules prohibited overlap of service contours. 47 C.F.R. §73.3555(d).

6. The FCC's Rules have been consolidated since the 1975 order went into effect. While it was part of the FCC's applicable rules and regulations, the prohibition on renewal was contained in 47 C.F.R. §§73.35(c), 73.240(c), and 73.636(c) (1977).

7. This provision of the rules was eliminated once the compliance period had passed. It was previously contained in 47 C.F.R. §§73.35 n. 8, 73.240 n. 8 and 73.636 n. 8 (1977).

8. Second Report and Order, Multiple Ownership, 50 F.C.C.2d 1046, 1088 (1975).

9. 47 C.F.R. §73.3555(a), (b) and (c).

10. 47 C.F.R. §73.3555(e).

11. It is interesting that within the Commission itself the strongest support for the cross-ownership proposals came from its conservative and liberal political extremes. Chairman Dean Burch was a former Goldwater presidential campaigner and a Nixon appointee. Nicholas Johnson, appointed by Lyndon Johnson, had often offended both broadcasters and his colleagues with his outspoken criticism of the establishment. See n. 12, infra.

12. Nicholas Johnson, The Media Barons and the Public Interest, Atlantic, June 1968, 43-51.

13. First Report and Order, Multiple Ownership Rules, 22 F.C.C.2d 306, at 335-36 (Chairman Burch, concurring and dissenting.)

14. 67 Cong. Rec. 12353 (1927) (remarks of Senator

Dill), cited by Daniel W. Toohey, "Newspaper Ownership of Broadcast Facilities,: Federal Communications Bar Journal 20 (1966): 44.

15. Christopher H. Sterling, "Newspaper Ownership of Broadcast Stations, 1920-68," Journalism Quarterly 46 (Summer 1969): 230, citing John H. Dunn, "Government Efforts of Separate Press and Radio Ownership: 1937-44," (Master's thesis, University of Wisconsin, 1948).

16. Port Huron Broadcasting Co., 5 F.C.C. 117 (1938). In this licensing decision, the Commission denied a construction permit to the president of a newspaper, finding that another applicant would add a new voice to information services in the area because he had no other media interests.

17. Sterling, supra note 15, at 230, citing Harry P. Warner, Radio and Television Law (Albany, N.Y.: Matthew Bender, 1948), 206-7.

18. Order No. 79, F.C.C. Mimeo No 48496, Mar. 20, 1941, cited by Toohey, supra note 14, at 48.

19. James F. Foley, "The Newspaper-Radio Decision," Federal Communications Bar Journal 7 (Feb. 1944): 12. See also Sterling, supra note 17, at 230, and Toohey, supra note 14, at 47.

20. Toohey, 47.

21. F.C.C. v. Stahlman, 75 App. D.C. 176 (1942).

22. Toohey, at 49-50, citing Notice of Dismissal of Proceedings, Newspaper Ownership of Radio stations, 9 Fed. Reg. 702 (1044).

23. Id. at 49.

24. Id. at 49-50.

25. Sterling, 235.

26. Belleville News-Democrat, 4 RR 1043 (1950), cited by Toohey, 52.

27. Sterling Quinlan, The Hundred Million Dollar Lunch, Chicago, J. Philip O'Hara, 1974, at 19-20.

28. First Report and Order in the Matter of Amendment of Sections 73.35, 73.240 and 73.636 of the Commission Rules Relating to Multiple Ownership of Standard, FM and Television Broadcast Stations, Docket No. 18110, 25 Mar. 1970, 22 F.C.C.2d 306 (1970).

29. Id. at 307.

30. Id. at 311.

31. Id. at 335-36 (Chairman Burch concurring and dissenting).

32. Further Notice of Proposed Rule Making, Docket No. 18110, 22 F.C.C. 339, 340-46 (1970)

33. Id. at 340-41.

34. U.S. Deputy Assistant Attorney General, Antitrust Division, Letter to Secretary, FCC, 11/28/73. Petition to Deny Renewal Application in the Matter of Cowles Communications, Inc., Des Moines, Iowa, for Renewal of Licenses of Stations KRNT, KRNT-FM, and KRNT-TV, Des Moines, Iowa, File Nos. BR-515, BRH-2813, and BRCT-246, 1/2/74. Petition to Deny Renewal Applications in the Matter of Pulitzer Publishing Co., St. Louis, Missouri, File Nos. BRCT-30 and BR 641, and Newhouse Broadcasting Corp., St. Louis, Missouri, for Renewal of License of KTVI(TV), St. Louis, Missouri, File No. BRCT-520, 1/2/74. Petition to Deny Renewal applications in the Matter of Midwest Radio-Television, Inc., Minneapolis, Minnesota, for Renewal of Licenses of Stations WCCO, WCCO-FM, and WCCO-TV, File Nos. BR-659, BRH-2496 and BRCT-49, Before the FCC, 3/1/74. Petition to Deny Renewal Applications in the Matter of Stauffer Publications, Inc., Topeka Kansas, for Renewal of Licenses of Stations WIBW, WIBW-FM and WIBW-TV, File Nos. BR-573, BRH-1316 and BRCT-181, 5/1/74. Petition to Deny Renewal Applications in the Matter of KSL, Inc., Salt Lake City, Utah, for Renewal of Licenses of Stations KSL, KSL-FM and KSL-TV, 9/3/74. Petition to Deny Renewal Applications in the Matter of McClatchy Newspaper for Renewal of Licenses of Stations KMJ, KMJ-FM and KMJ-TV, Fresno, California, File Nos. BR-7, BRH-538 and BRCT-166, 11/1/74. Petition to Deny Renewal Applications in the Matter of KHQ, Inc. for Renewal of Licenses of KHQ, KHQ-FM and KHQ-TV, Spokane, Washington, File Nos. BR-76, BRH-117 and BRCT-147, 1/2/75.

35. Oral Argument, Multiple Ownership, Docket No. 18110, 3 vols. (July 1974).

36. See n. 34, supra.

37. Second Report and Order, Multiple Ownership, supra note 8, at 1059-61, 1073-74, 1093-94.

38. Id.

39. Id. at 1061.

40. Id. at 1074.

41. Id. at 1076.

42. Id. at 1072, 1093.

43. United States Dept. of Justice, Comments, Multiple Ownership, Docket No. 18110 (5/18/71):

> Broadcast licenses are merely one of a large number of income producing properties on the market at any given time. Potential investors in income producing properties do not limit their analysis to available broadcast licenses. . . . In this much expanded market, another twenty sources a year will hardly change the supply.

44. Id. at 1072.

45. Id. at 1076.

46. Id. at 1073-74, 1093-94.

47. NCCB v. FCC, 555 F. 2d 938, 959 n. 70 (D.C. Cir. 1977).

48. Lorna Veraldi, Newspaper-Broadcast Cross-Ownership: Antitrust Law and Regulatory Policy, 158-91 (Master's thesis, University of Utah, 1976).

49. Id. at 165-66.

50. Id. at 182-87.

51. Second Report and Order, supra note 8, at 1073, 1093. See also NCCB v. FCC, 555 F.2d at 957, citing Respondent's Brief, p. 9.

52. Id. at 1075.

53. Applying the "substantial evidence rule," federal courts have upheld regulatory agency's decisions as long as the record contains such evidence "as a reasonable mind might accept as adequate to support a conclusion." Consolidated Edison Co. v. NLRB, 305 U.S., 197, 229 (1938), quoted in Universal Camera Corp. v. NLRB, 340 U.S. 474, 477 [1951]).

54. FCC v. NCCB, 98 S.Ct. 2096, 2108, citing Second Report and Order, at 1076, 1080 n. 30 (1978).

55. Second Report and Order, Multiple Ownership, at 1078.

56. Id., Statement of Commissioner Glen. O. Robinson, Concurring in Part and Dissenting in Part.

57. NCCB v. FCC, 555 F.2d 938 (D.C. Cir. 1977).

58. 98 S.Ct. 2096 (1978).

59. Id. at 2122.

60. Id. at 2112-14.

61. Id. at 2115.

62. Id. The court contrasts the clearly discriminatory tax imposed only on newspapers, on the basis of their circulation, invalidated in Grosjean v. American Press Co., 297 U.S. 233 (1936).

63. Id. at 2115-16.

64. James C. Goodale, The FCC as Player in the Media Game, New York Law Journal, 10/1/93, 3.

65. Oral Argument, Multiple Ownership, vol. 2, p. 308 supra note 35, (testimony of Stephen Barnett).

66. Id. at vol. 2, p. 325 (testimony of Don Elliot Heald, on behalf of Cox Broadcasting Corp.).

67. Id. at vol. 2, p. 360 (testimony of Harvey J. Levin, Center for Policy Research).

68. Herbert H. Howard, Group and Cross-Media Ownership of Television Stations: 1988. Washington, D.C.: National Association of Broadcasters (1988), 4-14.

69. Ben H. Bagdikian, The Media Monopoly. Boston, MA: Beacon Press, 1992, at 122-24.

70. Rich Brown, KXLY-AM-FM-TV-CABLE set to debut, Broadcasting & Cable, Mar. 14, 1994, 18. KXLY licensee, Morgan Murphy Stations, is affiliated with newspapers (Evening Telegram Company) outside Spokane. Broadcast Yearbook, Washington, DC: Broadcasting Publications, 1991, A-50.

71. Steve McClellan and Rich Brown, TV stations go for the channels, Broadcasting & Cable, Sep. 13, 1993, 8-10.

72. Hollings, Kennedy stir up hornet's nest over cross-ownership, Broadcasting, Jan. 11, 1988, 42.

73. For an interesting discussion of the apparent hiatus Senator Kennedy enjoyed from criticism while Rupert Murdoch was awaiting FCC approval of the Post waiver by the FCC, see, e.g. Douglas Feiden and Alan Mirabella, Post waiver bashing, Crain's New York Business, July 12, 1993, 6:

> No sooner did the New York Post receive its waiver from the Federal Communications Commission than it declared open season once again on its long-time nemesis, Sen. Edward Kennedy. . . . The Post had been on better behavior while the FCC was considering giving Mr. Murdoch a waiver from the law that prohibits cross-ownerships of media outlets in a market.

74. Peter Viles, Congress may open door for increase in paper-radio crossownership waivers, Broadcasting & Cable, Oct. 25, 1993, 36.

75. Elizabeth Sanger, Murdoch now owns the Post, Newsday, Oct. 2, 1993, 12.

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AEJMC 1994 Conference in Atlanta
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New Media Departure in *The Principle of Relative Constancy*: VCRs

Ghee-Young Noh

The Principle of Relative Constancy and VCRs
Macro level: Diffusion of VCRs
  Recent pattern of media consumption expenditure
  Model of the VCR diffusion
  Impacts on existing broadcasting
Micro level: Functional Duality of VCRs
  Functional competition: History of Television
  Functional complement: VCRs
Conclusion

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The diffusion of VCRs in the 1980s is comparable to that of black and white television in the 1950s. Most households in the U.S. own more than one VCR and use them to playback rented, prerecorded videotapes. However, even if the growth pattern of VCRs closely resembles black and white television, the impacts on existing mass media seem to be considerably different. Among several kinds of impacts, the consumer spending has been one of the main concerns in mass media economics.

According to *the Principle of Relative Constancy* (PRC), consumer expenditures on new media have no impacts on the total consumer expenditure on mass media. Thus, had some moneys not been consumed for new media, the money would have been consumed for old media. Studies of TV assert that, despite significant economic growth, TV's share of consumer dollars was wrested away from other mass media, primarily the movies (McCombs 1972, Fullerton 1988). In 1948, when TV was new on the American market, motion picture admissions totaled $1.50 billion. Five years later, the movies' annual admissions had dropped to $1.17 billion, representing annual net loss of $330 million (McCombs, 1972, p.39). Media consumers diverted resources from other media uses during the period of television diffusion.

However, more recent PRC studies which include VCRs (McCombs and Son, 1986; Son, 1990; Wood and O'Hare, 1991; Son and McCombs, 1993) have reported that VCRs do not follow the constancy trend in economic support of the PRC. These studies show that the total consumer spending on mass media is not relatively constant but increased. While existing studies have discovered the aberration from the PRC, the main reason for this aberration has not been explained. They have not confirmed whether this departure is temporary or permanent.

McCombs (1972) and Fullerton (1988) also observed a similar departure in the initial diffusion of television. In the case of television, the initial departure from the PRC was temporary. Fullerton provided a useful cue that early adopters are an exception to the PRC. He distinguished two types of departures to the PRC: a revolutionary technological change and an ordinary evolutionary one. The fact that there are two types of departures seems to be widely accepted.

The PRC can serve as an analytical tool for examining the introduction of new media in the contemporary marketplace (McCombs and Nolan, 1992). To be truly useful in today's media environment, however, the reason for the new media exception to the PRC must be understood. This paper examines whether this departure from a pattern of relative constancy is a temporary deviation or a permanent change in consumer behavior. Why has the VCR market proven to be an exception to the PRC? It may be that all new contemporary media result in exceptions to the PRC. What kind of usefulness does the departure from the PRC serve in media analysis?

The two distinguishing types of departures to the PRC may be determined by media functionality, that is, whether it is a functional competitor or a functional complement. Thus, while television, in the past, had been a functional competitor to other mass media, VCRs are somewhat a functional complement to existing mass media. This is a crucial point in examining the departure from the PRC. The position of this paper is that this departure reflects permanent changes in consumer behavior. In exploring this exception to the PRC, this paper intends to link together the macro level and micro levels of analysis, addressing this phenomenon.

The Principle of Relative Constancy and VCRs

The Principle of Relative Constancy historically provided a sound explanation for the new media marketplace. For example, the growth of audio and visual media almost perfectly matched the relative decline in spending on print media. McCombs' initial empirical analysis (1972) established the relative constancy hypothesis as a principle of mass communication economics. The principle asserts that although there is a fluctuation of money among the various mass media, the pattern of consumer expenditures on mass media follows the general state of the economy. The PRC was originally articulated by Charles E. Scripps.

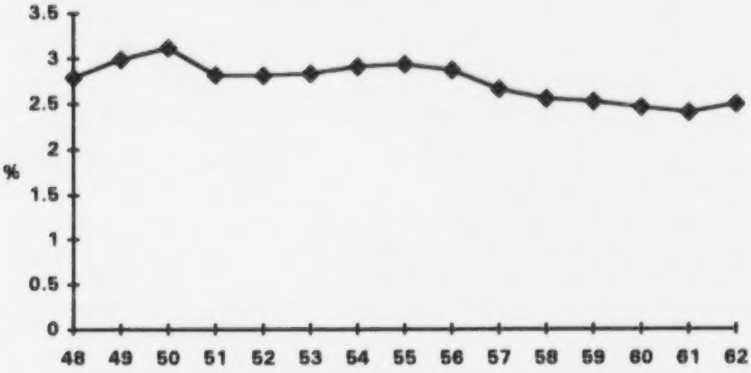
> " (I)n spite of the increasing complexity of mass communications with the advent of new media, the pattern of economic support has been relatively constant, and more closely related to the general economy than to the various changes and trends taking place within the mass media field itself." (Scripps, p.4, cited in McCombs, 1972, p.5)

Thus, when they have more money, consumers will spend more on mass media. When they have less, they will spend less on mass media.

McCombs (1972) found support for the PRC in statistics on spending for mass communications from 1929 to 1968. The dollar increase in media spending by consumers paralleled the general growth of the consumer economy almost perfectly. During this period, the trend for consumer spending on mass media, as a proportion of total consumer spending, was constant averaging 3.04 percent, with a standard deviation of .19. McCombs and Eyal's additional study (1980) also concluded that the larger economic context of mass communication expenditures remained stable between 1968 and 1977. Employing disposable personal income as a control variable, Wood (1986) found mixed results. The full sample period of

1929-1981 supported the PRC, but the short-run tests rejected it in two of the five decades.

<Figure-1> The Consumer Spending on Mass Media (1948-1962)
(% of Disposable Personal Income)



Data: Fullerton, 1988, p.78.

The PRC also can describe the relationship among the various mass media in the marketplace. McCombs and Eyal (1980) suggested that the trends on spending for various mass media need to be considered in a larger context summarized by the PRC. For example, when a new medium in the marketplace begins to compete with exiting media for a share of market, there are inevitable changes in consumer spending on each medium.

> "Because audiences have limited resources of money and time, they must reallocate these resources in order to support new media. In other words, they re-slice the media pie. If that is not sufficient, audiences must divert resources from other goods and services outside of the marketplace for mass media." (Son and McCombs, 1993, p.21)

The basic assumption regarding the relationships among media is this: if one medium gains a bigger market share, then others must lose as much. This equates to a zero-sum game in expenditures on mass media. In zero-sum games, value is neither created nor destroyed. What one player wins, the other loses, and vice versa (Zagare, 1984). Within total consumer media expenditure, the increase of media expenditure A and the decrease of media expenditure B offset each other. The PRC assumes zero-sum games.

Some of the new communication technologies require such large dollar support that they must drastically reduce the share of several existing competitors to survive in the marketplace. McCombs (1972) suggested two conclusions regarding new media. First, the PRC is a valid description of audience spending behavior even when highly fascinating new media appear in the marketplace. Second, even during periods of rapid economic growth, new media must battle some of the established media for a share of the market.

However, studies of the VCR's impact on media spending showed that the VCR diffusion did not have a negative influence on spending of exiting media. In constant dollars, each household spent $1.37 for VCRs in 1976. In 1987, each household spent $137.46. Consumer spending on VCRs increased from 0.005 percent of disposable personal income (DPI) in 1976 to 0.46 percent in 1987 (Son & McCombs, 1993, p.31). McCombs and Son (1986) suggested that these massive expenditures came largely from new money attracted to the marketplace. They concluded that the rapid growth of VCRs was attracting spending from outside the media. Thus, the introduction of VCRs in the media marketplace has changed the historical pattern of economic support for mass media.

Wood (1986) also argued that in a future decade, constancy would fail to hold as consumers devote a greater share of income to the mass media in order to buy new technology. Wood and O'Hare (1991) reported that new video technology such as VCRs was established without displacing the older mass media. Consumers had spent an increasing share of income on mass media in 1979-1988. In 1979, mass media spending commanded a 2.57 percent share of income. If that share had remained constant over the decade, consumers would have spent only $89.4 billion on the mass media in 1988 instead of the $113.8 billion that they actually spent (p.28-29). They concluded that the introduction of new technology has structurally changed consumer spending. The reason for this exception was explained as consumers' willingness to spend an increased share of income on the mass media. However, no explanation has been offered for the increase in consumers' willingness.

Son and McCombs (1993) also confirmed the exception to the PRC after the introduction of other new video technology. Although they could not test the separate effect of VCRs, they found that total consumer spending on mass media increased from 1975 to 1987. In constant dollars, consumer spending on mass media was 2.15 percent of DPI in 1975. In 1987 the figure was 3.69 percent, a sizable increase (p.30). They suggested that the advent of VCRs and cable TV had shifted both consumer spending for individual media and overall spending on mass communication.

To sum up existing studies, the audience diverted money from outside the marketplace for mass media to support VCRs. As a result, total mass media consumption increased over time. In short, the *Principle of Relative Constancy* did not constrain the economic support of VCRs' consumers.

Macro level: Diffusion of VCRs

Recent pattern of media consumption expenditure

Before we examine the reasons for the VCR's departure from the PRC, the trend of consumer spending on mass media must be explained. As we discussed earlier, the recent PRC studies that included the VCR use discovered that consumer spending on mass media was increased, not constant. However, the PRC-oriented concepts can be measured by several methods.

Existing studies of the PRC (McCombs, 1972; McCombs and Eyal, 1980; Wood, 1986; Wood and O'Hare, 1991; Son and McCombs, 1993) measured the relative constancy of consumer spending in mass media and found that consumer spending was proportional to disposable personal income. The consumer expenditure on mass media has been approximately 5% of disposable personal income. Furthermore, recent studies (Wood, 1986; Wood and O'Hare, 1991; Son and McCombs, 1993) discovered that the total consumer consumption of mass media was increased in the short-term. However, the short-term period for the study was chosen arbitrarily, so that their studies do not contain special information such as the year the pattern began increasing and the degree of increase. A more important point is the nature of the increasing pattern rather than the increase itself. To obtain significant information from the increasing constancy pattern, a new measurement method will be employed to explain the relative constancy.

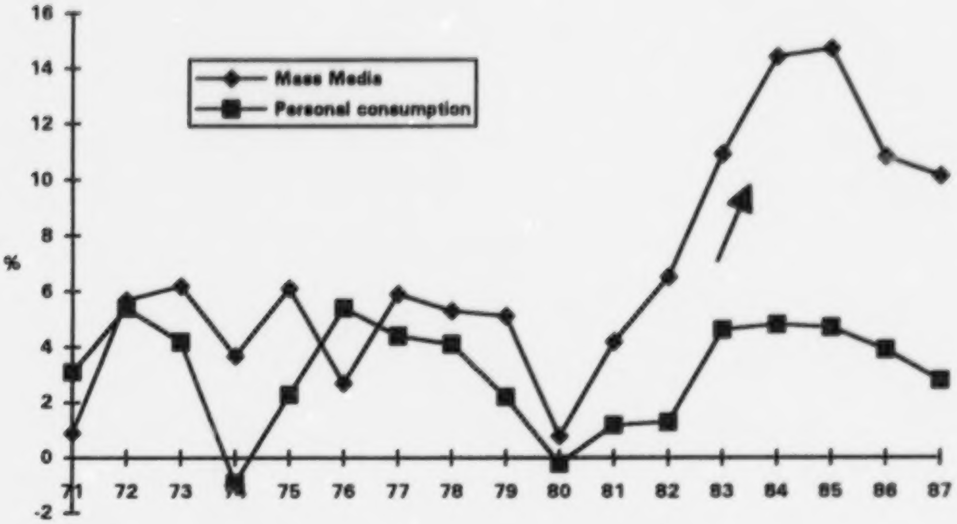
First of all, in order to compare with the general economy and consumer spending on mass media, we can measure the constancy by examining rate of change. If the consumer spending on mass media doesn't change relative to the general state of consumer economy, the overall growth of the general economy implies that consumer spending on mass media has to grow in relative proportion to the growth of the general economy. Thus, the changing rate of both cases must be same. The changing rate of personal consumption expenditure can represent the general state of the consumer economy. Therefore we can compare the changing rate of personal consumption expenditure with the total consumer spending on mass media. The deviation of their values represents the degree of constancy on mass media expenditure. That deviation may be the constancy index on mass media expenditure. In other words, the constancy index expresses the constancy of consumer spending on mass media. If the PRC holds, the index of constancy will be zero. Even if the constancy index is not zero, if the deviation of the constancy index is stable, then one may assert that the trend in mass media consumption follows that of the general economy. The constancy index is formulated as below.

$$IC(t) = MM(t) - PC(t)$$

$IC(t)$ = Index of Constancy
$MM(t)$ = Change of Consumer Spending on Mass Media (%)
$PC(t)$ = Change of Personal Consumption Expenditure (%)
$[t] = [\text{year}]$

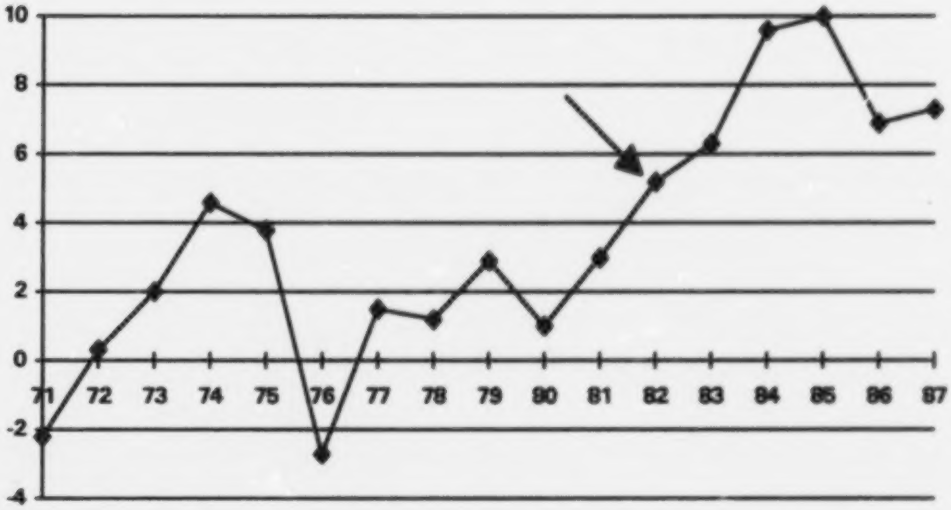
Figure-2 illustrates the pattern of mass media expenditure and personal consumption from 1971 to 1987. Figure-3 illustrates the constancy index for the same period. The results of this new method confirm those of existing studies and provide some new insights. Figure-2 shows that a new constancy pattern started in

<Figure-2 > The Changing Rate of Mass Media Spending and Personal Consumption Expenditure



Data: Daring (ed.), 1992, p.12.
Son, 1990, pp. 146-147

<Figure-3 > The Pattern of *The Index of Constancy*



1982. While the constancy index, until 1982, deviated about the mean score of 1.40 (standard deviation of 2.18), a latter part of the figure shows the fluctuation of the constancy index occurred about a mean score of 7.55 (standard deviation of 1.72). Evidently, the mean of the new pattern is 6.15 higher than that of the old pattern. Thus, consumers have spent significantly more on mass media than the increasing rate of the general consumer economy since 1982.

In 1982, the early adopters began to adopt VCRs, and it was 1984 when the early adopters completed their adoption of VCRs. Surprisingly, in 1984, the index of constancy showed the highest score than any other year. It may be inferred that the diffusion of VCRs has impacted the pattern of constancy.

Model of the VCR diffusion

Once VCR sales took off in the 1980s, the growth in household penetration is very comparable to that of black-and-white television in the 1950s. In comparing VCRs to color television, VCR diffusion initially lagged behind that of black-and-white television, yet has clearly diffused more rapidly than color television. Although the VCR took 11 years to reach 30% penetration, it took color television considerably longer. Only radio and television reached 30% of homes faster than VCRs. Historically speaking, the VCR has diffused very rapidly in the US (Klopfenstein, 1989).

One main reason for the expeditious adoption of VCRs in the US is falling prices. In 1975, when VCRs were first introduced in the US, Sony's Betamax home recorder sold in combination with a television set for $2,200. By 1985, the price had dropped to $300 (Rogers, 1986, p.136). The format battle between Beta and VHS actually served as a catalyst to VCR diffusion. Not only did their lower cost bring about more rapid adoption, but the enlarging market also contributed to forceful price competition. Rental charges also have dropped dramatically for a one-day rental of a theatrical film.

Second, the introduction of the videodisk player unexpectedly made the VCR a more attractive consumer electronic gadget. Thus, while some consumers became interested in purchasing a videodisk player, many selected the more versatile VCR. The VCR could perform the playback function of the videodisk player and added the recording function for about the same price as the videodisk player (Klopfenstein, 1989).

The third reason for the fast rising of the VCR diffusion is a wide range of prerecorded cassette tapes available for purchase or for rental. Over 14,000 prerecorded cassettes were on the market in 1985, including movies, music videos, children's programs, and various types of how-to cassettes (Rogers, 1986). Rental convenience has also improved to the point where there is a nearby video store in almost every neighborhood. Primary titles may always be found in grocery and convenience stores.

Modeling VCR diffusion according to traditional diffusion theory, we find that the diffusion to innovators and early adopters was completed in 1985. Diffusion to the early majority, 50% of all adopters, continued until 1987. [1] The most recent study of the PRC including VCRs (Son and McCombs, 1993).

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[1]) Diffusion of TV showed the highest rate of new adoption when the TV marketplace expanded to about 25%. On the other hand, diffusions of cable TV and VCRs revealed the highest rate of new adoption at about 35% of marketplace expansion. These points can serve as criteria for prediction of market expansion. In contemporary new media, the rate of new adoption begins to decrease at the turning point of 35%.

contained data through 1987 only. However, full-scale adoption of later adopters started in 1986. According to adopter categorization (Rogers, 1983), earlier adopters are relatively more active information-seekers. They tend to pursue information from expert sources. Most of all, they have greater exposure to mass media communication channels than later adopters. Therefore, the adoption by earlier adopters until 1985 may not substitute for cable TV, motion pictures, or other broadcasting but might represent the pursuit of more information through use of VCRs.

Many studies on VCR adopters reported that while early adopters used VCRs mainly for time-shifting, later adopters were more likely to use them for pre-recorded video rental. The early adopters of VCRs use their VCRs as a complement to, not as a replacement for, established patterns of broadcast exposure. Thus, instead of choosing alternative program content, what VCR households do is rearrange the broadcast schedule, making viewing more convenient or eliminating programming conflict (Levy, 1981). Early adopters may have been motivated by a desire for more network television, where later adopters were looking for alternative to network television (Klopfenstein, Spears and Ferguson, 1991).

Thus, while uses of early adopters tend to complement the function of existing mass media, uses of later adopters tend to compete with the functions of existing mass media.

Impacts on existing broadcasting

VCRs have an advantage over cable in the control of content and viewing time. With a VCR, thousands of movies and other pre-recorded titles are available with new titles added each month (Baldwin and McVoy, 1988). Table-1 reveals two key factors from 1984 to 1990; accelerated VCR penetration and a slower rate of cable penetration. VCR penetration experienced its fastest growth from 1984 to 1990, when it increased from 10.6 to 69.7 percent. Figure-4 shows the effect the VCRs' growth has on cable TV's growth.

The impact on broadcasting by the diffusion of VCR is apparent as well. Due to time-shifting or video-renting activities, the concept of prime-time TV has become questionable. The VCR use has been steadily eroding broadcast program ratings by segmenting the audience shares (Lin, 1990, p.87). Therefore, the money spent on VCRs comes not only from outside mass media, but also from existing mass media. However, the VCR's impact on existing mass media is moderate rather than strong, unlike the TV's impact on existing mass media during the diffusion period of TV. What does this moderate impact mean?

A statistical study by two economists at the FCC found "strong support for the proposition that VCRs and cable TV are substitutes." It also reported "some support to the conclusion that VCRs and broadcast television are complements" (Compaine, 1985). Contrary to their expectations, however, the VCR did not completely substitute for cable TV. Apparently, the diffusion of VCRs reduced the diffusion of cable TV. However, the impact on cable TV is moderate. What is causing this moderate impact?

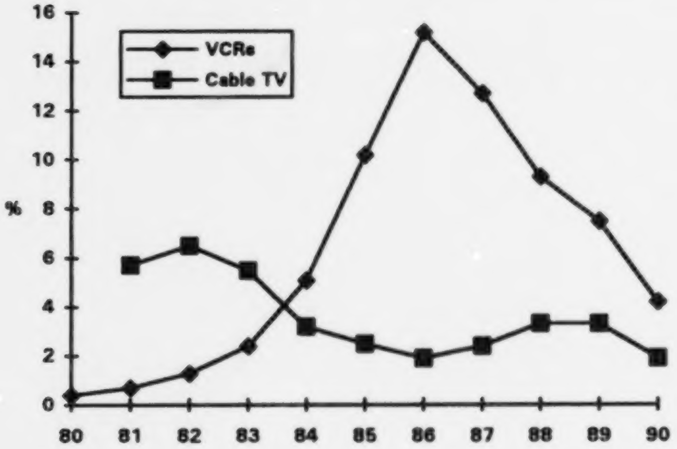
One factor is the aggressive marketing effort to counter VCR use by cable operators. Operators used a variety of marketing methods to get the word out that cable and VCRs go hand in hand. In order to address this issue, operators had to

< Table-1 > Penetration of VCR and Cable TV

Year	VCR penetration(%)	Cable penetration(%)	Prime-time share for three major networks(%)
1980	1.1	22.6	87
1981	1.8	28.3	84
1982	3.1	35.0	80
1983	5.5	40.5	77
1984	10.6	43.7	75
1985	20.8	46.2	73
1986	36.0	48.1	73
1987	48.7	50.5	71
1988	58.0	53.8	67
1989	65.5	57.1	64
1990	69.7	59.0	62

** Krugman and Rust, 1993, p.69.

<Figure-4> Relationship between diffusion of VCRs and cable TV
- *Rate of new adoption*



deal with the technological problem that kept a subscriber from watching one show while taping another that was being shown at the same time. In 1985, Charles Townsend, marketing vice president at United Cable Television, asserted, "we have to make sure our customers are happy with their VCRs. We must make them compatible technologically so the subscriber doesn't have to spend more money to have both."(Rothbart, p. C13).

But, effective marketing provides only a partial explanation. The main reason for the moderate impact on cable TV is the functionality of the VCR and the needs of the audience.

Micro Level: Functional Duality of VCRs

The basic assumptions regarding the function of mass media are: 1)audiences take the initiative to use and select mass communication media, and 2)they are influenced by social and psychological factors when selecting among communication alternatives.. Media can be classified by functional features, and the base of audience spending in mass media is a selection of media function.

Functional Competition : History of Television

A good case of *the Principle of Relative Constancy* is television. The historical increase of spending in television matched the decrease of spending in other mass media, especially films. But there was a temporary exception to this principle. TV spending took a sharp jump in 1949 and 1950. A comparison of the percentage changes in media spending and in aggregate personal income over the 12-year period (1948-1959) showed that only in 1949 and 1950 did media spending grow faster than aggregate income. McCombs (1972) confirmed that there did seem to be some short-term dislocation of consumer spending on media in these two years. But the aberration in the PRC caused by television diffusion quickly returned to the constancy pattern. Thus, in the case of television, the departure was evidently a temporary upturn.

In the case of television, the PRC held because TV is a functional competitor to other mass media. The PRC assumes the mass media to be functional equivalents (McCombs, 1972).

At this point, the range of mass media in the existing PRC studies must be examined. Even though the classification of statistical data limits the range of mass media, we can confirm the concept of mass media in the PRC. The mass media in the PRC studies include books, newspapers, radio, cinema, and television. Recent studies added cable TV and VCRs. When television first appeared, the major mass media were books, newspapers, radio, and cinema. The relationship between these mass media and television is functional competition. Katz, Gurevitch, and Hass (1973) reported television has high interchangibility with radio and cinema and some interchangibility with newspapers and books. There is a division of labor among these mass media. For example, books and cinema work mainly for individual connection and on the other hand, newspapers, radio, and television work for social connection. Thus, most functions of television are functional alternatives to existing mass media - radio, cinema, and newspapers.

Functional Complement : VCRs

The VCR provides alternative media content and contexts, and complements and extends other modes of communication. In contrast to traditional media, which provide the audience with a constrained range of options, VCR technology provides a plethora of content options and allows greater communicative choice, participation, and control.

The characteristics of the active audience also represent the technical orientation of VCR users. VCR audiences are ardent tape renters. They deliberately view the programs they have taped and view their favorite tapes more than once (Shatzer and Lindlof, 1989). That is, they can handle every feature on the VCR, prefer to buy electronic gadgets fully equipped, like to play around with it. The VCR was not difficult for them to learn to use. Thus, the VCR is enabling new audience behaviors. In many cases VCR audiences become distinct segments that exhibit different viewing habits and watch less traditional television. Uses of VCRs primarily include movie rental, time-shifting, and video library building (Rubin & Bantz, 1989; Lin, 1992).

Pre-recorded video rentals provide alternative viewing choices that are unavailable on the current TV program schedule. All VCR adopters have energetic rental activity based on many factors, including the rapid growth of video outlets, the increasing number of titles available, and decreasing rental costs (Klopfenstein, Spears and Ferguson, 1991). VCR rentals have created a genre of viewing that is different from traditional broadcast or standard cable TV. Audiences are more likely to prepare to view rental movies. VCR movie rental is also a pseudo-shopping behavior. For some individuals, the VCR movie rental may be closer to a cinema experience than a television experience (Krugman and Johnson, 1991).

The renting of video tapes is also negotiated among friends as well as family members. Moreover, rented movies play an important role in parents' efforts to find space and time for themselves at home (Jordan, 1990, p.177).

Recordings made for time-shifting purposes are for viewing at a later more convenient time. Time shifting usually means planning of viewing in advance, if program recordings are to be made on time. Time-shifting implies quick replay and then tape reuse, which erases the previous program, and library building implies extended program life, in the sense of both possible multiple replays and prolonged shelf storage (Levy and Fink, 1985, p.574).

In fact, time-shifting meets both mass and interpersonal communication needs. For example, not only can the scheduling of a television program be shifted to a more convenient time, but also to a time when other family members also can watch (Rubin & Bantz, 1989, p.192). Littlejohn (1983) also referred to the regulatory function as one of interpersonal communication needs: one regulates one's own behavior. Thus, control commonly refers to a person's mastery of his or her environment and life. Control is an interpersonal communication need, yet further suggests that those who seek to achieve control can do so in both personal and mediated contexts (Rubin & Rubin, 1989).

Video library copies are made for delayed playback purposes, which can mean a long interval between recording and playback time. These means a desire to retain tapes and to use VCRs as a convenient alternative to scheduled programs. Also, the use of video library copies may be related to socialization or interpersonal communication when families or friends get together to watch videos in a social setting. Video libraries can be compared to print libraries. VCR use allows television to be defined by audiences as resembling other stored, on the shelf media like magazines and books, or other daily sensory choices (Levy and Fink, 1985, p.573). Jordan's (1990) observational evidence found that audiences use video as supplements to, not replacements for, books. Parents often offer children bedtime video, and the children were as likely to select a book as a video.

Even if videotape rentals are currently worth a great deal more than tape sales, the latter is growing rapidly. In 1989, 300 million tapes were purchased. The percentage of homes that purchased a videotape has risen from 6.2 percent in late 1986 to 16.4 percent by 1989 (Lee and Katz, 1993). Purchased tapes may be viewed multiple times. Dobrow (1990) points out that reasons for repeat viewing of video tape are education, initiation and solidarity, control over content, and making the ephemeral last.

What does this active audience behavior say? In fact, active audience behavior is related to interpersonal communication. The concept of mass, in traditional mass media, is premised on inter-loneliness without the exchange of experience. Therefore, even if many researchers discovered active behaviors of audience, the audience of mass media unavoidably retains its original passive characteristics.

Active behaviors of the VCR audience are qualitatively different than active behaviors of TV audiences. In the case of VCRs, the active character is a result of the functioning of interpersonal communication. Whether communicator or receiver, interpersonal communication is a prerequisite to interactivity with another person. Thus, interpersonal communication requires the concentration of attention.

Users of VCRs demonstrate active participation in communication that is evident in interpersonal communication. Using VCRs provides active interpersonal communication links as well as mass communication links. Therefore, VCRs are not just mass communication, but mediated communication (Rubin & Bantz, 1989, pp. 192-193). We use VCRs to interact socially with others. To socialize, we might first use VCRs to establish a library of programs and to reorder time. These motives speak to the purposeful and active uses of this medium, and to the links between personal and mediated communication (Rubin & Rubin, 1989, p.106).

Of course, VCRs also serve as functional competition to existing mass media. Thus, VCRs represent a functional duality. The sectors of functional competition may substitute audience spending on existing mass media. Pre-recorded tape rental is a functional competitor to cinema and cable TV. This sector contributes to maintaining *the Principle of Relative Constancy*. But, unlike television the functional competition of VCRs does not substitute for audience spending on existing mass media. As we analyzed earlier, there is only moderate substitution. That is because VCRs also represnent a functional complement to mass media. Time-shifting, video library building, educational uses and special tapes represent a functional alternative to interpersonal communication. Rubin et al (1985) summarized four functions of interpersonal communication - education, ego-defensive, value-expression and knowledge. The function of education is an important function of the VCR. VCRs not only enable audience to have more control over the medium, but also in particular, to review information and study it at their own pace. Exercise tapes enable reduced education and transportation costs for the user. Home video is a useful instrument of value expression. Perhaps, the most important function of all is that of socialization. The opportunity for greater socializing is confirmed by the fact that more individuals are in the room for a movie rental than for traditional television (Krugman and Johnson, 1991). In addition, tapes may be rented or prepared through and time-shifting for others.

Therefore, when examined at different level of analysis, it becomes clear why the diffusion of the VCR resulted in an exception to the PRC. Looking at the utilization and needs of the audience, the VCR provides more than mass communication utilities and needs. The VCR offers a mixed function including mass communication and interpersonal communication. The VCR is both a functional competitor and a functional complement to existing mass media. In most social interaction, players generally have both competitive and complementary interests. Games of this sort are termed nonzero-sum game (Zagare, 1984). The VCR's growing presence is not fully attributable merely to the outside media as pointed out in this paper. Spending resources on the VCR partially comes from the existing available media resources because of the mixed function of VCRs ans partially from new sources. In summary, some of the money came from present mass communication and other funds came from the social interaction or interpersonal communication marketplace.

Conclusion

Since 1982, consumer spending on mass media has considerably deviated from *the Principle of Relative Constancy*. The increasing rate of consumer spending in media has kept its new pattern, and not returned its original pattern. The new pattern may be a new constancy trend of media consumption expenditure. The proportion of media spending has increased due to the appearance of new media - technological change- and market competition surrounding the new media, not due to the general consumer economy. This new pattern has been mainly attributable to the introduction of VCRs.

This paper examined the departure from the PRC that VCRs represented at the micro and macro levels. VCRs provided a functional complement to the existing mass media until 1985, when the diffusion to early adopters was completed. However, in the case of later adopters, VCRs have been stronger in functional competition than functional complementarity. Therefore, VCRs have had a more negative impact on existing broadcasting than initial stages of VCR diffusion. In other words, VCRs have had a dual impact on existing broadcasting at the macro level.

This duality, in fact, stems from the functional duality of VCRs at the micro level. VCRs provide more than the function of mass communication. VCRs are also used to satisfy interpersonal communication needs as well. This duality of the VCR function has altered the consumer spending pattern for media.

In conclusion, when we examine the introduction of new media from the perspective of *the Principle of Relative Constancy*, we find that it would hold if the new media represents wholly the needs and function of mass communication. But most new communication services have ambiguous boundaries. As we see in the case of VCRs, most new media are more personal than conventional mass media; computer mediated communication and teleconferencing are good examples. The new communication services also require redistribution of consumer spending on media. Therefore when we analyze the new media through the PRC, as it is presently formulated, exceptional cases may continue to occur. The PRC needs to be reclassified for a media marketplace segmented according to the communication needs of the audience. The simple mass communication marketplace may not be useful for analysis of new media any longer.

Future research efforts in this area should examine two issues. First, it may be that how next generation services of communication influence the pattern of consumer spending on media. Second, what is functional relationship between new communication services and existing communication services?

The above results have significant theoretical implications. The PRC, and uses and gratifications approach represent two sides of the same coin. Thus, the departure from the PRC means the appearance of media with different functional alternatives. The uses and gratifications approach may inform media functions whether functionally competitive or complementary. On the other hand, the PRC may be useful in understanding the pattern of consumer spending in media. If certain media offer a strong functional competition, the consumer spending in media may keep its original constant pattern with a temporary increasing trend. However, if certain media provide a strong functional complement, the consumer spending in media may start a new historical pattern of constancy. Therefore, results of uses and gratifications perspective are tested by those of the PRC. Each result can complement the other to provide a true analysis of media reality.

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WHY THE WESTERN DESIGN APPROACH DOES NOT WORK FOR ASIAN LANGUAGE COMPUTERS

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*** Top Student Paper**

WHY THE WESTERN DESIGN APPROACH DOES NOT WORK FOR ASIAN LANGUAGE COMPUTERS

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Ohio University

Abstract

The computer age for ideographic-based Asian languages is stalled hopelessly in the research and development laboratories of experts who are trying to perfect a keyboard that fits Western standards. This means most keyboard designs are alphabetic, or some other convoluted multi-step process for typing character languages such as Chinese. Meanwhile, linguists and psychologists are finding that the brain actually processes ideographs much differently than words written in alphabets. This paper suggests a new approach to computer design for ideographic languages.

WHY THE WESTERN DESIGN APPROACH DOES NOT WORK FOR ASIAN LANGUAGE COMPUTERS

INTRODUCTION

In the March 1993 edition of *Asian Sources Computer Products* there was not a single article or advertisement for a truly Asian language computer within its 568 pages. Literally, every glossy photograph of a keyboard featured the English alphabet. Only three ads made references to "Japanese keyboards" or "keyboards available in any language." Yet, this is probably the largest trade publication that is targeted specifically to the Asian computer market. In the 12 issues of that magazine published since last March, nearly all the computer ads feature alphabetic keyboards.

One year earlier, in the March-April 1992 edition of the *Asian Mass Communication Bulletin*, an article from *China Daily* was reprinted that said, "Since China sells only 100,000 computer systems a year, the speed of application of computer technologies needs to be stepped up, as the future of China's fledgling computer industry depends on it" (Vol. 22, No. 2 p. 9).

Everyone is anxious to tap into the 1.5 billion potential of China's computer market, but there is a serious problem with the types of computers available to people who communicate in Chinese and Japanese. They are based on a Western approach to computers, including most of the research being conducted in Singapore, Japan, Korea, Taiwan, and The Peoples' Republic of China. This paper will first support this theory, and, secondly, will suggest new ways to approach computer design based on a broader, multi-disciplinary study of research in linguistics, psychology, and neuro-psycholinguistics taking in two relatively new concepts of ethnocognitivism and brain hemisphericity in language learning.

There is a phrase often used by editors in newsrooms who feel their reporters are losing touch with a story. They will tell the reporter that he or she is "too close to the story." This means the reporter has done so much research on a particular subject or has conducted so many interviews, that it has made it difficult to see the subject from a layman's point of view. Therefore, when the reporter writes the story it lacks clarity and simple explanation. In other words, the reporter starts to assume the reader knows more about the story than is actually the case.

This same thing is happening with computer experts who are attempting to develop a quick and efficient way to electronically communicate in ideographic languages. They have lost one of the most essential ingredients to scientific research: creativity.

Where is it written that a keyboard is needed to operate a computer? Is typing really the most efficient way to manipulate a computer in all languages? With all the bravado of computer companies which claim bigger and better storage capacities in smaller and smaller units, why do designers throw up their hands in frustration when storage and easy retrieval of a language with 50,000 characters (Chinese) is discussed?

Most of these questions have the same answer: The majority of computer research and development is being conducted by people who are either native English speakers or who are fluent in English as a second language. Nearly all international conferences on computer technology are conducted in English, and the subsequent research presented at those conferences are written in English. Most computer programs are in English and those that sell in "foreign" markets have been translated into other languages.

This last point may seem insignificant if the conventional argument is accepted that says as long as a program is translated into other languages it is serving the needs of the international community. But this paper will present research that shows the very nature of a language determines how people think and how they communicate. Therefore, the language that computer hardware and software is designed for affects how that computer will best suit the needs of users from different cultures who speak different languages.

A good example is the IBM Chinese-language program called *Brushwriter.* It offers the user four choices for inputting information, including typing in a romanized version of Chinese called Pinyin which uses the English alphabet, or typing in parts of characters to receive a set of characters to chose the desired character from. But in most cases, the word is typed in with the appropriate tone (there are four tones in Chinese) and the user is given a choice of several characters that meet that criteria. With the word "shi" in the second tone, the user must select from over 36 different characters that meet that criteria. It would be as if each time the word "and" was typed in an English-language software package the user had to look through 36 different spellings to find the appropriate word. In short, this is ridiculously time consuming, yet it is a standard approach to computing in Chinese!

THE GLOBAL COMMUNICATION NEED

There seems to be two approaches to this dilemma. 1) Some people say to efficiently keep pace with the explosive developments in international telecommunications computers must be an interactive technology that is easily transferable to all languages. 2) It is also argued that to bring the entire world community into efficient telecommunication all languages must be brought on line. These are the ideological approaches to the problem of telecommunication technology growing much faster than policy and standardization is formed to regulate it.

In reality, the language of computing is dictated by the countries with the most research and development, marketing, political power, and/or need for computers. This is why there are very few computers designed for people who live in less developed countries such as Kenya, because they have a restrictive government and not much technological infrastructure to handle a lucrative computer market. Also, Kenya and other Sub-Saharan African countries are not politically powerful in the global arena. On the other hand, many programs have been converted to Russian, not because there is a lot of computer research and development going on in the countries of the former Soviet Union, nor because high volumes of computers are being built in those countries. Russian is much more a language of political and economic power than say a language like Swahili, and this is reflected in computer programs made available in these languages.

It seems obvious, but necessary, to mention why it is essential to develop computers that best interact with the language of a particular culture. The more compatible a computer is the more it is used. The more computers are used the more people will hook up to services such as electronic mail, computerized news services, and the numerous other possibilities for using computers to further the advancement of education, medicine, international communication, and positive humanitarian efforts worldwide.

ALPHABETIC VERSUS IDEOGRAPHIC

The central issue that this paper examines is that computers have historically been designed to fit alphabetic languages and that computer designs for ideographic languages (also called logographic languages) currently available are mere variations of alphabetic-based systems, making them difficult, slow, and awkward to use.

A. **Brain Hemisphericity**: The biggest difference between a language based on an alphabet, which uses phonetics, compared to a language based on characters, is in how the brain processes the cognition of those languages. Hemisphericity refers to studies in the functions of the brain's left and right hemispheres based on the premise that individuals rely more on one hemisphere than the other in language cognition and other brain functions.

This concept dates back to 1836 when an unfortunate country doctor named Marc Dax in a paper at a medical society meeting in Montpellier, France, presented the first recorded research that suggested the brain functioned in two halves (Springer and Deutsch 1). Dax came to his conclusions after observing more than 40 of his patients who suffered aphasia (loss of speech) following damage to the left side of the brain. He also had patients who had damage to the left side of the brain, but who suffered no loss of speech. From these and other observations Dax reasoned that different parts of the brain controlled different functions of the brain. Dax was unfortunate because his research was widely scoffed at as being ridiculous and radical. He died a year later never receiving his due recognition. Instead, it was Paul Broca, who presented two papers in 1861 at the Society of Anthropology in Paris describing how cerebral processes are localized in the brain's two halves, who received the credit Dax so richly deserved (Springer and Deutsch 10).

Prior to Dax's observations, scientists believed that the brain functioned as a whole and that the two halves, which could obviously be seen in brain dissections, were like mirror images to each other and, therefore, operated in the same manner. Franz Gall, a German anatomist, believed the shape of the skull reflected the shape of the brain, and that bumps and ridges in the skull had some physiological significance (Deutsch and Springer 9). In the early 1800s French scientist Jean Baptiste Bouillaud proposed that the frontal lobes of the brain controlled speech. It was not unitl 1861, when Broca presented his two papers in Paris, that the theory of cerebral localization processes was outlined (Deutsch and Springer 10).

Research in this area expanded rapidly in the late 1800s. By 1864 Broca was positive that speech was controlled by the left hemisphere. (See Appendix A for the currently accepted breakdown of brain functions by hemisphere.) By 1868 British neurologist John Jughlings Jackson presented research suggesting one hemisphere is dominant (Deutsch and Springer 13), and by 1930 enough research had been done to establish functions of the less dominant half of the brain. Also by the early 1930s, Wilder Penfield, a neurologist at the Montreal Neurological Institute, performed the first operations to remove portions of the brain to treat epilepsy (Deutsch and Springer 19). These were some of the earliest experiments in brain surgery to alter behavior. In 1949 noted psychologist Ivan Petrovich Pavlov made the connection that the reflex basis of the mental processes are connected to the laws governing the cerebral cortex, and by 1941 scientist O. Vogt established that the brain is comprised of many small organs (Lauria 14-22).

Some of the most impressive research in this area has been conducted by Georg Deutsch and Sally Springer who contend that different languages result in different hemispheric dominance in the brain. Specifically, the cognitive process required to learn an alphabetic/phonetic language such as English, Arabic, German, or Russian occurs in the brain's left hemisphere. Conversely, the cognitive process required to learn an ideographic/morphologic language such as Chinese or the character component of Japanese, occurs in the brain's right hemisphere. In simpler terms, while both English and Chinese have morphemes and phonemes, learning to read English stresses phonological representation in an alphabetic system, while learning to read Chinese deals more with a narrow lexical level since more stress is on the morphological base (the smallest divisible unit of a language which cannot be broken into further units of meaning), rather than the broader phonological base in the language. Chinese is largely monosyllabic, which means that every word consists of a single syllable, therefore making this emphasis on small, nondivisible units of language more understandable. There are, however, many words in Chinese that consist of two or more characters to derive their meaning.

Ethnocognitivism and hemisphericity can, therefore, be logically linked to ask the question of whether a culture causes its individuals to have dominate left or right hemisphericity. The cross-cultural and international communication implications of this theory are numerous.

But most computers are designed to mimic a phonetic-based language. Yes, they are all based on the binary system, but that is translated into a keyboard that is based on the typewriter for an alphabetic language.

B. Linguistic Studies: A simpler way of understanding this difference comes from recent linguistic studies in Chinese reading comprehension that indicates one advantage of the language is that reading is directly tied to meaning (Wang 88). It shows that comprehension of Chinese occurs in two stages: 1) visual, and, 2) comprehension (cognition). Whereas, in English there is a third stage of tying meaning to sound, called sub-vocalizing. Even though the word is not read aloud, the reader: 1) sees the graphic image of a word, 2) sub-vocalizes the sound of the word, then, 3) processes it into meaning (cognition) (Wang 89). In reading Chinese this second stage does not occur.

It is much the way Americans interpret a stop sign. What they see is the image of the red octagonal sign that says "stop." They are not really reading the word "stop" in the three-step phonetic/cognition process, but rather interpreting the total symbol in a two-step process similar to reading a Chinese character. Scholars predict this process occurs in a person's right hemisphere.

Some of the most famous, and controversial, research on brain hemisphericity of ideographic-based languages was done by a Japanese specialist in hearing difficulties named Tadanobu Tsunoda, who wrote a book in 1978 entitled *The Japanese Brain: Brain Function and East-West Culture*, which became a surprising best-seller in Japan that year. The book was only recently translated into English.

In it, Tsunoda outlined his research based on dichotic listening tests conducted at Tokyo Medical and Dental University, that indicate people whose native language is Japanese have different brain functions from people whose native language is English or another phonetic-based language. (Japanese has two components: 1) characters, called Kanji, and, 2) the syllabary, or hiragana portion, which is phonetic based.) Tsunoda says Japanese native language speakers process nonverbal human sounds, animal sounds, and

Japanese instrumental music in the brain's left hemisphere, and that they process Western instrumental music in the right hemisphere (Samovar and Porter 231).

This directly contradicts traditional research that states all nonverbal sounds--human, animal, and musical--are processed in the right hemisphere. Tsunoda also says that people whose native language is Japanese process emotion in the brain's left hemisphere (Samovar and Porter 231). Again, this contradicts conventional research that states emotion is a right-hemispheric function in speakers of all languages.

Now before cries of racism ring out, it is important to emphasize that none of this research in hemisphericity is based on a person's race or culture, but on the native language of a person. So if, for example, a Caucasian American was raised with Japanese as his or her native language, he or she would have the same hemispheric dominance indicated in the research of Tsunoda, Springer and Deutsch. In other words, it is a neuralpsycholinguistic phenomena.

Many linguists and psychologists discount Tsunoda's research as invalid, but other researchers are still interested in his work.

C. Ethnocognitivism: Ethnocognitivism refers to dominant thought patterns within a culture. It is a long word, not found in most dictionaries, that represents an area of communication theory based on ethnolinguistics, meaning that a person's thought processes are directly related to that person's native language. Ethnocognitivism is fascinating because it combines several different academic disciplines. It emerged as a theory when anthropology was first linked to the study of linguistics in the 1800s. By 1900 psychology was linked to linguistics, and by 1910 the first major research in ethnolinguistics was conducted by scientist L. Levy-Bruhl. Levy-Bruhl's research was later referred to by H. Basilius, in 1952, as the movement of Neo-Humboldtian ethnolinguistics (Adams 157). That movement refers to T. Wilhem von Humboldt, a German linguist who is known for his research in the multi-functional nature of language. He believed that poetry could not be separated from music and that the language poetry was written in was insignificant to the process, but that how the mind processes prose depends soley on the language it is in and that it is dominated by thought, not rhythm.

Researcher Benjamin L. Whorf was one of the first scholars to concepturalize the idea of ethnocognitivism. In all of his research, around the 1930s and 1940s, there were two underlying themes: 1) that an individual's perception of the world via abstration, rationalization, and categorization processes is intimately tied to his or her native language, and 2) in that languages differ from each other suggests that people who speak those languages differ as a group in their psychological potential. Whorf is probably best known for the Sapir-Whorf hypothesis which again stated that the conceptual categorization of the world is partly determined by the structure of an individual's native language. Much of Whorf's reserach, which some linguists now reject, was an early building block for later ethnocognitive research.

There was a real blossoming of reserach in ethnocognitivism in the 1940s and 1950s, including research conducted by F. Kainz,

K. Goldstein, S. Morris, N.H. Pronko, D.L. Olmsted, and G.A. Miller. It was not until the late 1950s that psychology was applied to the study of physiology, which began the connection of linguistics and ethnocognitivism to brain hemisphericity.

Ethnocognitivism is more widely accepted and understood in many areas of research, including computer design, than the research described on language-specific hemisphericity. Hemisphericity, however, is more important to the theory, presented in this paper, that computers are designed to fit left-hemispheric language cognition such as English and German, and that very little research has been done on how to design a computer to fit right-hemispheric language cognition, such as Chinese and Japanese.

There is much more research that has been done in the areas of hemisphericity and ethnocognitivism, but space limitations preclude most of it from being outlined here. Ethnocognitivism is an older science than the area of brain hemisphericity, which relates to how languages are processed, even though hemisphericity (the brain having two distinct halves) was discovered before ethnocognitivism. Certainly there is now a wealth of valid research in both disciplines to justify applying that knowledge to computer design. Unfortunately, this has not successfully occurred in the laboratories of computer engineers worldwide.

CHINESE AND JAPANESE COMPUTER SOFTWARE, KEYBOARDS

A. **Understanding Pinyin:** The written Chinese language is one of two or three independent full scripts in human history (Mote 4). Scholars debate just how old the written language is, but most agree it is at least 4,000 years old. There is a huge volume of written historical documents that date to the Shang civilization around 1,500 B.C., and archeological digs in China conducted in 1986 revealed written scripts that may make it possibly the oldest written language in the world (Mote 5). The character component of Japanese comes originally from Chinese. In fact, approximately 75 percent of Japanese characters are the same in Chinese, even though the spoken language for those characters differs between the two languages.

It is the written component of Chinese that allows people of so many dialects to communicate with each other. For example, the Mandarin dialect of Chinese (which has four tones) is a completely different language from the Cantonese (seven tones) dialect of Chinese, but people who speak these two dialects can communicate relatively well through writing characters.

Modern stages of Chinese language development relate directly to Westernization of the language, as alphabetized romanization methods for learning the language have been around since the Wade-Giles method--named after two British missionaries who developed it--was introduced in China in the 1920s (Newnham 173). There have been several other romanization methods invented since, including Yale (created by scholars at Yale University), Gwoyeu

Romatzyh (created by Chinese scholars), and the Soviet system called Latinxua.

Pinyin is an alphabetized version of Chinese made up of 27 letters used to transcribe characters into a phonetic system. It has been the official romanization system in The People's Republic of China since 1958 (Newnham 174), and most computer systems for Chinese have some form of Pinyin application using an alphabetic keyboard.

For example, if a user selects the Pinyin application for IBM's *Brushwriter* software, the word is typed in Pinyin, then a 1, 2, 3, or 4, is typed to indicate what tone is required for the word, and a series of characters appears on the computer screen if there is more than one character for that word/tone combination. The user then selects the character they want.

But, as Dr. Mei-hua Zhai, a linguistics scholar and professor of linguistics and Chinese at Ohio University who uses the *Brushwriter* software explained in an interview on this topic, it can be cumbersome and time-consuming.

"If I want a clean copy that I plan to use in my (Chinese) class that I know I may want to revise later, I will use the computer," Dr. Zhai said.

"But if I just want to write a letter to a friend, I will write it in longhand because it is much faster than using the computer," she added.

Herein lies one of the biggest problems with computer applications for ideograph-based languages. They are slow. Anyone who is a fast typist will tell you that they far prefer to type something in English rather than write it out in longhand, simply because it is faster. Computers, with their ability to erase and write over errors, have made that word processing function even faster and easier--if you are writing in an alphabet-based language.

B. Learning Three Languages: To fully use a computer program such as *Brushwriter* the user is forced to learn the equivalent of three languages. The first two languages are Chinese characters and Pinyin, which is not the fault of the computer designers. The debate over whether Pinyin is Westernizing Chinese will be reserved for another paper. But, with *Brushwriter,* as well as less than a handful of other widely available Chinese language software packages, there is another amazing feature that is actually used by people such as teletype operators in China. The entire language, or at least the most commonly used words, has a conversion translation to numbers. A user need only memorize approximately 75 pages of numeric conversions of the language to successfully write the most commonly used Chinese characters on the calculator portion of the keyboard.

"I've seen teletype operators who are really fast and who only use these keys," explained Zhai, pointing to the calculator keys.

Imagine a computer company that devised a program where the user had to memorize a unique numeric equivalent for each word in English in order to use the program. The company would not only be laughed out of the business, but the program would not sell. Yet, computer designers actually offer this as an option for transcribing Chinese into a Western-style keyboard setup. This is insulting to the people who speak the most widely spoken language in the world.

More people speak Chinese than any other language in the world, but there has yet to be a computer designed specifically to fit that language.

SOME LESS COMPLEX SOFTWARE

A. The Two-Step Process: There certainly have been some attempts, however, to create more user-friendly and less complex Chinese software packages and this will now be examined. First, one reason for this lack of design again goes back to economics. If a keyboard fit only an ideographic-based language structure, it would not be marketable in the vast English/alphabetic-based language market of computers.

Even Japanese computers have alphabetic keyboards. However, it was the invention of the laptop computer that helped speed up the conversion process from the character component of Japanese to the phonetic component of the language. Most Japanese computers are now laptops that can be flipped, by hitting a command key, from a keyboard for displaying characters on the screen, typed in a romanization system, and the same keyboard that types out the alphabetic portion of the language on the screen.

Another method for typing Chinese characters in some computer programs comes about by typing in portions of a character. Chinese consists of 214 characters that are called radicals. These radicals can be words in themselves, and are also parts of other characters. There have been keyboards with as many as 350 keys designed to make room for the radicals and other commonly used characters, but these are again cumbersome and complex to use.

Most programs that deal with typing portions of a character place several characters in a grouping under a function key. Through a two- to three-step process the user goes into the character segment and searches out the exact character he or she desires to appear in the screen text. The character groupings, also used in some Japanese software packages, are sometimes based on the radicals, but are often based on word groupings.

Much of the research being done for strictly Chinese language keyboards relates back to this categorization structure, sometimes with as many as seven characters displayed on each key to log into different categories in the language.

Even researchers who are trying to make the typing process easier for untrained typists in Chinese use this categorization process. Four researchers at the National University of Singapore, Chan Sing Chai, Low Hwee Boon, Yu Wellington Chia-peir, and Chang Ifay discussed this problem in their paper entitled "Conceptual Framework and the Implementation of Intelligent Chinese Input," which was presented at the 1986 International Computer Symposium held at National Cheng Kung University in Tainan, Taiwan.

They explained that many input methods are available to the Chinese computer users, but that "many methods relied on the assumption that the users possessed certain previous knowledge . . .However, for a first time user or the infrequent users, the input methods provided so far do not have the same [appeal] as the English keyboard input" (Chai et al 1,487).

They go on to explain, "The English keyboard is 'obvious' to any user whereby a person without any typing training can still use it to enter the English text slowly even with one finger or one hand" (Chai et al 1,487). They explain that Pinyin and stroke-order computer systems require the user to know the exact Pinyin spellings and tones (many Chinese do not know Pinyin), and that stroke order requires the user to know exactly how a character is stroked. This is similar to requiring English script writers to know an exact, standardized set of rules for writing longhand.

After examining the more than 400 Chinese input schemes available for computers, Chai, Boon, Chia-peir and Ifay concluded that the two-step process was the most efficient (Chai et al 1,491). However, this process still uses an alphabetized keyboard and requires typing two letters, such as A and B, to call up any single Chinese character. Again, this requires a great deal of training. These researchers conclude that "an easy to use and easy to learn Chinese input system can be built on a low cost standard English keyboard with a mouse device" (Chai et al 1493).

Like much of the ongoing research, this is based on using existing English keyboards for processing Chinese characters. This paper argues that this is not only a backhanded approach to word processing in ideographic languages, it is also like comparing apples and oranges in the research laboratory. In essence, as long as the research and development is based on alphabetic-language keyboards and computer concepts a creative approach will never be arrived at for computing in ideographs.

B. **The Calligraphy Approach:** Some of the best research that has been done in the area of Chinese computer programs uses a method of computerized Chinese calligraphy. This successfully combines the fields of ethnocognitivism and hemisphericity because it considers the cultural and historical importance of calligraphy in China and Japan, and it is the only application, other than voice activated processes, that does not use a Western style keyboard.

Recent research has Chinese and Japanese educators very concerned. It indicates that people who use computers for even a short period of time begin to lose their knowledge of how to stroke a character. Since this does not occur in alphabetic languages, it directly relates to the difference between the two types of language structures. When typing an alphabetized word the typist is still spelling out the word, and sounding out the word phonetically--the identical process that occurs when writing in script.

However, when a person who normally strokes a character uses a computer, he or she is not stroking the character but instead going through a Pinyin-to-character process, or radical base-to-character process. In no portion of the process does the user stroke the character.

This is why the research conducted by Yoshinao Aoki and Chong-ming Shi in computers that generate calligraphic characters is so relevant. Aoki and Shi are faculty members in the Division of Information Engineering at Hokkaido University in Japan. They have devised a computer, with a keyboard for basic commands (and an alphabet for switching to romanization) that has as one component a large, mechanized arm that strokes calligraphy on a computer tablet (Aoki and Shi 1,496).

They contend the most useful application for this research is in generating signs and artistic word processing. However, they presented their initial research in 1986, before psychologists had discovered the affects of using computers on loss of stroke order memory. It is clear that Aoki and Shi's research should now be considered in new designs for ideographic software as a more efficient approach to word processing in Chinese and Japanese.

C. Voice Application: In recent years a great deal of research has been conducted in voice application to computers. Many people who work in the international arena are anxiously awaiting the perfection of technology that allows people to speak into a computerized telephone that will automatically translate one language into another language. A front page in the The New York Times earlier this year, this technology has only just reached the stage of a handful of words that computers are capable of translating between English, German and Japanese (New York Times, Jan. 29, 1993, A1).

Parts of this same technology are being applied to the creation of large, multi-language computer dictionaries. This research is much more advanced, while the perfection of a working computer telephone translator is at least 10 years away.

Electrical engineers Soo-Chang Pei and Twei-Ying Wang, of National Taiwan University, have conducted extensive research in the area of Chinese speech processing as a means of inputting information into computers. In fact, this research may be more applicable to Chinese, since it is a language of crucial intonation, that other languages that do not imply word meaning from tones.

THE PROBLEM OF PRINTING

Finally, there is a major difference in printing Chinese or Japanese characters as compared to printing written alphabetic scripts. In essence, an ideographic character pacts many more intricate lines and images into the same area that a letter is printed. Literally, it takes a much finer quality printer to print an ideographic character than is required to print a romanized writing system.

Also, Oriental ideographs often require that a radical be printed in varying sizes to fit the number of strokes in a character. For instance, the radical for "heart" (three strokes) would appear much larger on its own than if it were only part of another character that might have up to 15 strokes. It is a challenge to program a printer to understand this difference in character size.

The technology has been perfected, but only recently, and it is an ongoing process. Hewlett Packard has created a Japanese language printer, the DeskJet 500J, that "is the first of several Asian language inkjet products that the Hewlett Packard's Asia Peripherals Division (APD) in Singapore expects to introduce over the next few years" (AMCB, Vol. 21, No. 5, 8). This printer is capable of printing in Kanji (characters) and Roman Latin. A similar printer is available for Chinese.

The key question here is why has it taken this long to perfect a printer that duplicates the most commonly written language in the world? It is because computerized printer technology began in alphabetized languages and engineers are only now beginning to perfect similar technologies for ideographic-based languages.

CONCLUSION

This paper has had two purposes: 1) to convince the reader that most research and development in computer technology today is being conducted from a Western point of view based on alphabetic languages, and, 2) to show that there are two communication theories--ethnocognitivism and brain hemisphericity--that have not been considered in computer design.

This has the ultimate implication of computer research and design that lacks a fresh, creative approach when considering applications for ideographic-based languages. The disciplines of engineering, psychology, linguistics, and neurology must be combined in the future to create workable software and hardware that best suits people whose native language results in cognition in the brain's right hemisphere rather than the left hemisphere.

As experts in these fields begin to work together more in coming up with successful computer designs, the necessity for fast and efficient global telecommunications will be more easily met. Organizations such as the United Nations, the European Community, and international research institutions will greatly benefit from this truly interactive technology that does not mesh the cultures and languages of the world's people by phasing ideographic languages out of the mainstream, but, rather by recognizing the need to fully understand and incorporate these languages into global communications.

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Appendix A

BASIC FUNCTIONS OF EACH BRAIN HEMISPHERE

The most widely cited characteristics may be divided into five main groups, which form a kind of hierarchy. Each designation usually includes and goes beyond the characteristics above it:

Left Hemisphere	**Right Hemisphere**
verbal	nonverbal, visuo-spatial
sequential, temporal, digital	simultaneous, spatial, analogical
logical, analytical	Gestalt, synthetic
rational	intuitive
Western thought	Eastern thought

* Reprinted from the book Left Brain/Right Brain by Georg Deutsch and Sally P. Springer (New York, N.Y.: W.H. Freeman and Company, 1989) p. 286.

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Cross-Media Response to Digital Manipulation of Still and Moving Images

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RUNNING HEAD: Digital Manipulation

Cross-Media Response to Digital Manipulation of Still and Moving Images

ABSTRACT

This study provides survey data for a cross-media comparison between newspaper photo editors and television news directors to assess the ethical response to digital image processing and enhancement technology. The findings indicate that TV news directors tend toward more lax standards in application of the technology. However, the TV people showed more sensitivity to aspects of the technology that relate to long-standing themes of TV critics.

Cross-Media Response to Digital Manipulation of Still and Moving Images

With the introduction and spread of computer-assisted digital manipulation of still and moving images (print and video photography), the adage that "photos don't lie" has become problematic for magazines, newspapers, and television. Numerous scholars and media professionals have identified the core issues as truth, deception, and journalistic credibility--and the potential loss of public trust in visual journalism.[1] Some pose as the crucial question: Where does image enhancement end and distortion begin, and where does distortion end and deception begin?[2]

Merely by its presence, digital imaging technology worries some observers because it poses the temptation to use it in certain ways--if for no other reason than the mere desire to use a technology previously unavailable.[3] The question arises: With manipulation easier, faster, and traceless with the new technology, are news professionals today more often and more strongly tempted to manipulate photos, and to what degree are they tempted to yield to that temptation?

Much of the research into the ethical response to the new digital manipulation technology has focused on the print media. Little empirical research has been directed to digital image processing technology adopted by local TV stations. That is probably a reflection of the fact that TV has lagged behind newspapers in adoption of digital technology for image processing, although TV stations have adopted digital technology for numerous applications.[4]

The primary aim of the present study is to provide a cross-media comparison between newspapers and television stations, using survey data to (a) measure the extent to which newspapers and TV stations have adopted digital imaging and enhancement technology, and (b) update and expand our understanding of the media's ethical response to such technology.

Background and Literature

Manipulation of photographic images is as old as the technology of photography itself. For years photojournalists generally have accepted as standard practice such techniques as cropping, dodging (lightening), and burning in (darkening) the print.[5] Generally they have eschewed flipping a photograph, switching left side to right, because it reverses reality and the symmetry of the object. Generally, photojournalists avoid dropping out and eliminating backgrounds, using airbrushes to remove or add objects, and cutting and pasting photos (blending separately shot photos into a seamless whole).[6]

In a survey in which 511 visual newspaper editors assessed specific photo manipulation practices, Reaves found that editors generally were "very critical of any kind of digital manipulation. Except for the traditional practices of printing, (burning and dodging), they were strongly intolerant of digital manipulation of the specific photo examples. At least 50 percent consistently strongly disagreed with 14 of the 15 examples of digital manipulation."[7]

Generally, ethicists agree the problem with the new digital technology is not the manipulation and retouching, but the speed, ease, and precision by which it can be done, and the fact that there is no trace of alterations. Reaves found that editors value digital editing capability because it (a) avoids expensive re-shooting of flawed photos, (b) enhances quality of color separations for reproduction, (c) corrects bad color; assures color quality, (d) repairs scratches; removes cosmetic glitches and globs, (e) allows transmission of color separations in the form of digital data to remote printing presses, (f) helps organizations meet tight production deadlines, (g) makes photo manipulation flawless, and (h) saves labor and money in the long run. The "disquieting difference" with the new digital technology, Reaves observed, is that shadows can be corrected, sizes can be matched to scale, and colors and objects can be cloned to match perfectly. What concerns some newspaper professionals, she added, is that they work in a business aimed primarily at reflecting or mirroring reality, yet they are working with a technology that effortlessly and imperceptibly accommodates distortion of reality.[8]

There is some disagreement in the newsroom concerning values attached to photos used exclusively for news and photos used exclusively for feature illustration.[9] Reaves found only partial support for the hypothesis that newspaper photographic editors are significantly more tolerant of combination photos (combining visual elements from different photos) if they are used for a magazine cover or illustration.[10] In an earlier study she found that generally digital manipulation is barred absolutely on the news side, except to assure color quality and remove cosmetic glitches and globs.[11] It was in this absolutist spirit that the Associated Press distributed a written statement to its photo personnel in 1990 stating, "The content of a photograph will NEVER be changed or manipulated in any way."[12] Similarly, the National Press Photographers Association approved a policy that reads, "We believe it is wrong to alter the content of a photograph in any way that deceives the public."[13] That can depend on the "presentational context" of a feature illustration or cover art, i.e., whether the reader is able to know the photo has been altered.[14] Some newspapers have separate rules for different sections of the paper, with page one of the front section generally held as "sacred," but the living or lifestyle section not. Some editors argue that altering a feature-page photo is open to debate because it often makes "no claim on reality."[15] Still, some editors rule out digital alteration even for illustrative photos, just as some editors rule out traditional methods such as airbrushing and cutting/pasting.[16]

Some news professionals like the idea of letting readers or viewers know when a photograph is real and when it is a computer creation.[17] This can be done by placing a small disclaimer ("altered", "composite" or "retouched") adjacent to photos. The Associated Press Managing Editors Association already has stated that any altered photo should have a disclaimer caption.[18] However, one recent study of 304 media outlets found that newspaper editors and TV news directors alike tended to mildly oppose the notion that if a photo has been manipulated, for whatever reason, the audience should informed of the fact.[19]

Another newsroom concern relates to the electronic camera, which has entered some newspaper newsrooms but remains still on the horizon for television stations.[20] Unlike digital manipulation of conventional photographic images (made on film) that have been scanned electronically and transferred (digitized) into a computer, with the electronic camera, film is eliminated entirely from the process. Because magnetic storage discs used by electronic cameras are made to be used over and over again, some news professionals worry that no one will know what the original image looked like or that the image was retouched, i.e. there will be no equivalent to an original, permanent negative.[21]

Some critics are concerned that institutional efforts and approaches to provide ethical guidance for digital image processing and manipulation are inadequate[22]; some call for adoption of ethical "protocols" to provide systematic procedures to help decide when and how to manipulate images.[23] A recent survey of 304 media outlets showed that 44 percent of newspapers and 49 percent of TV stations said they relied on written codes of ethics, but the survey did not ask if the codes specifically addressed digital manipulation.[24] Another recent study, however, found that only 21 percent of newspapers surveyed had written standards on photo manipulation.[25] How TV stations compare is not known.

Most studies cited thus far relate to print journalism. While some excellent qualitative studies have considered ethics of photojournalism from a television news perspective[26], there is little survey data and practically none related to the ethical issues of digital manipulation of moving images.[27] A few cross-media studies have examined how newspaper and television news executives differ in perceptions of media ethics more generally, but there has been little, if any, attention to issues related to digital manipulation.[28]

There exists, however, a considerable body of research and criticism regarding television that leads one to suspect, by implication, that television news departments may be more lax with digital manipulation and therefore more prone to its use. This is not to suggest that TV news executives are less sensitive than newspaper executives to the ethical issues per se, but rather that they face different pressures and constraints in the routines and conventions of news gathering and reporting.

Numerous studies, dating back to the mid-1960s, amply demonstrate that because of the nature of the medium of television, including the bias of its technology, television news reflects a heavy emphasis on visuals and spectacle, telling the story through pictures or moving images. Along with that goes the charge that TV news is preoccupied with surface appearances and cosmetics. Television news thus is said to subordinate function to form by allowing visual elements to determine news selection rather than merely accommodate and enhance it; stories are played up or down not because of inherent news importance but rather the potential for captivating visuals.[29]

Television news is also affected by economic constraints stemming from its close association with show business; to compete with entertainment fare on TV, and thus maintain acceptable audience ratings, TV is prone to elevate entertainment values over informational values, i.e., gratify the audience's surface whims and ignore their deeper informational values.[30] Postman sums up this broad body of literature when he asserts that the central problem of television is not that it "presents us with entertaining subject matter but that all subject matter is presented as entertaining."[31]

Finally, TV news' affinity with show business includes an interchangeability of parts with many of the production modes and technology and personalities of the entertainment business. This is demonstrated by the make-believe mindset, the knack for contrivance, and the use of actors in production of news docudramas, staged re-enactments, and simulations.[32] In 1989, when ABC News used actors to "simulate" the scene of a U.S. diplomat giving secrets to a Soviet agent, or in 1992 when NBC rigged a "Dateline NBC" demonstration of a GM pickup truck to expose safety hazards, some people behind the scenes had experience in the networks' entertainment and sports divisions.[33] Perhaps more important is the supremacy of ratings, whether in the news or the entertainment division.[34] Some have suggested that it is not coincidence that NBC's bogus truck crash demonstration aired during "sweeps" month (which establishes network ratings) and that NBC happened to be in last place among the networks.[35] If these standards apply at the major networks, one has to wonder what standards local TV stations are applying as they adopt digital manipulation technology.

Given this background, the major research expectation of this study is that, compared with newspaper photo editors, TV news directors will tend to be more lax in application of digital manipulation technology. At the same time we expect TV news directors, mindful of critics' long-held criticism, to be more sensitive to aspects of manipulation technology that negatively affect their presumed ability to convey the news without distortion. The study is exploratory in nature and therefore no formal hypotheses are presented.

Methodology

Questionnaires were mailed in 1993 to 221 photo editors--one at each U.S. daily newspaper with a circulation exceeding 50,000--and 450 television news directors in U.S. markets ranging from largest to 205th largest. To achieve roughly equal numbers of respondents in both groups, it was necessary to make the sample of TV news directors approximately twice as large as the sample of photo editors. That is because TV news directors, being a popular target for researchers, are often deluged with survey questionnaires and thus return rates tend to be depressed.[36] Also, while photo editors may receive their share of questionnaires, TV news directors are a more concentrated target because they constitute a smaller occupational group.

Because smaller newspapers are not likely to afford equipment for digital manipulation, they were excluded from the study. TV news directors were drawn from all markets since even small TV markets tend to outsize small newspaper markets. Names of photo editors were obtained from the 1992 Editor & Publisher International Yearbook; names of TV news directors were drawn randomly from the 1993 Broadcasting & Cable Yearbook.[37]

A modified Total Design Method for mail surveys was used.[38] Personalized cover letters, survey questionnaires, and postage-paid return envelopes were sent. This was followed by a reminder postcard 14 days later. Budgetary restrictions prevented mail-out of a second mailing to nonrespondents. The mailings were done in two waves: the first (photo editors) in March 1993, and the second (news directors) in November 1993.

The overall response rate was 43.4 percent (N=291). Response rate for photo editors was 62.9 percent (N=139); 76 came from papers with 50-100,000 circulation, while 63 came from papers with 100,000-plus circulation. Response rate for TV news directors was 33.8 percent (N=152); with half ranging from the largest to the 69th largest markets, and the other half ranging from the 70th largest to the 205th largest markets. Response rates generally were on a par or better than similar mail surveys of TV news directors and newspaper photo editors.[39] Newspaper photo editors and TV news directors were compared as groups using the SPSSx statistical package.

The questionnaire consisted of several open- and closed-ended questions aimed at measuring the extent to which newspapers and TV stations have adopted computer equipment for digital processing and manipulation of photographic/video images. The rest of the questionnaire consisted of statements paired with a five-point Likert scale (1=highly agree; 5=highly disagree). Some statements were nearly identical in wording for both groups, making it possible to compare the groups' means scores and percentages. The questionnaires for the two groups were different in that some statements were specific to the medium.

Results

Return percentages for each demographic category indicated a satisfactory respondent mix, roughly in line with industry percentages.[40] Both groups were heavily male-dominated, with 132 male and six female photo editors, and 128 male and 23 female news directors. Median age for photo editors was 39, for news directors, 40. Almost three out of four photo editors and one half of the news directors were in their current position for three or more years. Roughly 85 percent of respondents in both groups had more than 10 years of media experience.

Eighty-nine percent of the photo editors said their newspaper is equipped to digitize conventional photographic images and manipulate (pixels) to alter images; only 72 percent of the news directors said their station can digitize videotape and manipulate (pixels) to alter images. At those stations without such equipment, about three quarters of the news directors said cost was the reason for nonadoption. Answers to statements addressed specifically to a medium indicated that only seven percent of the newspapers have adopted electronic cameras; 24 percent said they expect to adopt by 1995, 45 percent said by 2000. Eighty four percent of the TV directors said their station had adopted graphics generators (for drawing, coloring, animating, storing, and retrieving of images electronically) and digital video effects (DVE) technology (allowing digital manipulation of the overall video signal and producing effects that appear as spins, multi-image montages, graphic zooms, etc.).

Table 1 shows that TV news producers were significantly more likely than the editors to see a difference between conventional (film/video) photography (with its manipulative use of telephoto, wide-angle lens, and artificial light) and digital methods. Seventy-three percent of the editors agreed they saw no difference while only 46 percent of the TV people expressed that view. In a separate question for editors, 89 percent agreed they see no ethical problems with traditional manipulation of photos (cropping, dodging, burning).

Asked if it bothers them that their medium aims to mirror reality in news reports yet adopts digital technology that effortlessly, imperceptibly distorts reality, respondents taken as a whole showed a mixed response, with 36 percent saying it bothers them and 32 percent saying not. However, news directors were significantly more likely than editors to be bothered. Both groups taken as a whole strongly supported an absolutist position when it comes to deceiving the public with alteration of content of visual images; 91 percent said it's wrong.

Editors were significantly more likely than TV people to firmly bar digital manipulation from hard news content, as opposed to entertainment or feature fare. Ninety-one percent of editors and only 48 percent of TV news directors agreed that digital manipulation to drop out or alter backgrounds, remove or add objects, etc., should be limited to content with no news value. In a separate statement for editors, 60 percent agreed digital manipulation for feature illustration should depend on "presentational context," whether the reader is able to know the photo has been altered.

Taken as a whole, 70 percent of respondents disagreed that digital manipulation technology will negatively affect news content of their medium; however, editors were significantly more likely than TV people to say it will not have a negative effect on their medium. Seventy-seven percent of the editors agreed that digital manipulation technology increases the temptation to manipulate images unethically, while only 49 percent of the TV people agreed.

As to some of the more subtle ways of manipulation, there was no significant disagreement. Fifty-two percent of all respondents agreed it is wrong to digitally manipulate colors to achieve a desired hue; 22 percent disagreed and 23 percent were neutral. Asked if it was disquieting that digital technology allows shadows to be corrected, sizes matched to scale, and colors and objects cloned to match perfectly, roughly one third agreed, one third disagreed and one third was neutral.

Editors were significantly more likely than TV people to agree that too often photographers (camera people) value visual impact over story comprehension. Fifty-seven percent of editors and 47 percent of TV news directors said photographers are more concerned with "how did it look?" than "did the viewer understand it?"

TV people were significantly more inclined than editors to alert the audience about manipulation. Eighty-four percent of TV directors and 61 percent of editors agreed viewers/readers should be informed when an image has been altered. Concerning the coming of electronic cameras, both groups had equally mixed reaction, with 33 percent worried, 37 percent not worried, and the remainder with no opinion.

Newspapers were significantly more likely to have ethical protocols procedures to decide when and how to manipulate images; 66 percent of editors and 58 percent of TV directors said their media outlet has such protocols. Moreover, protocols seem to be working better for newspapers than TV stations. Fifty-two percent of the editors and only 32 percent of the TV people agreed the protocols are satisfactory and rarely, if ever, debated by decision-makers. Regarding application of written ethics codes in matters related to digital manipulation, 49 percent of all respondents said their media outlet does not rely on such codes to determine if manipulation is permitted. However, of the outlets that do rely on them, newspapers were significantly more likely than TV stations to use them (31 percent v. 13 percent).

Discussion and Conclusion

A major finding of the study is that seven out of 10 of the survey respondents believe that digital manipulation technology will not negatively affect news content of their respective medium. However, compared with the TV people, the newspaper people were significantly more confident of no negative effects.

A second major finding of the study is that the two groups significantly differed in their belief that digital manipulation technology increases the temptation to manipulate images unethically; almost three out of four editors acknowledged that the technology increases temptation, compared with only half of the TV people. Also important, though not surprising, is the finding that newspaper photo editors and TV news directors alike believe it is wrong ethically to alter the content of visual images in any way that deceives the public.

A third major finding is that newspaper photo editors were significantly more likely to firmly bar manipulation of hard news content, as opposed to entertainment or feature fare. The disagreement between the two groups was strong, with 91 percent of the newspaper people insisting that digital manipulation to drop out or alter backgrounds, remove or add objects, etc., should be limited to material with no news value. Only 48 percent the TV directors agreed with this position, thus indicating a more lax stance than the newspaper people.

In Reaves's recent survey of 511 visual newspaper editors, she reported that editors generally were "very critical of any kind of digital manipulation." Except for traditional practices of print (burning, dodging, etc.), they demonstrated strong intolerance of digital manipulation, with at least 50 percent consistently strongly disagreeing with 14 of 15 specific photo example of digital manipulation.[41] The present study supports Reaves's findings in that approximately nine out of 10 photo editors adopted an absolutist view with respect to prohibiting digital manipulation if applied to hard news content or if it deceives the public.

However, this study indicates that a significant portion (although not a majority) of newspaper and TV people alike are tolerant of more subtle forms of image manipulation. One out of five of all respondents, for example, saw nothing ethically wrong with digitally manipulating colors to achieve a desired hue, and one out of three saw nothing wrong using digital manipulation to correct shadows. Furthermore, in a separate question to the newspaper people, six out of 10 photo editors indicated they would permit digital manipulation depending on the presentational context, i.e. whether alteration is obvious to the reader.

A related finding is that roughly three out of four of all respondents urge informing readers/viewers that an image has been altered. That TV news directors were significantly more inclined than editors to do so probably is a reflection of their awareness of recent scandals and criticism involving phony news simulations and staged demonstrations and the blurring of fiction and reality in docu-dramas, re-enactments, etc. The same rationale may explain why TV news directors were significantly more prone to be bothered by the fact that they work for a medium that presumes to mirror reality in its news reports yet adopts a technology that so easily distorts it. Furthermore, it may be that because newspapers rely more on written text than pictures (which presumably do not lie), photo editors may be less inclined than TV people to presume their medium mirrors reality. The mirror metaphor is perhaps more fitting for a visual medium like TV.

The study shows that TV news directors also are significantly more likely than the newspaper people to see a difference between conventional photographic/video methods (specifically use of telephoto and wide-angle lens and artificial light) compared with digital processing of images. A likely explanation: Photographers are more inclined to see both the old and the new methods as fully manipulative, considering that they routinely engage in the art of picture enhancement through traditional methods of cropping, dodging, and burning in of photographic images. Moreover, TV news directors are probably more inclined to accept tools such as telephoto lens and artificial light as intrinsic to their medium, whereas newspaper photo editors probably are more sensitive to the way light and special lenses can distort images. TV also has lagged behind newspapers in adoption of digital image processing and manipulation technology, and photo editors may be more comfortable with the technology now that some of their early concerns about unethical distortion have worn off.

TV news directors were significantly more defensive than photo editors about the charge that camera people (photographers) value visual impact over story comprehension. Their sensitivity might be explained by the fact that this is a common criticism of TV. Also, as the research literature on TV cited earlier attests, TV more so than print values telling a story in the simplest and briefest terms as it aims its messages to the broadest possible audience. The charge of audience incomprehension no doubt is anathema to TV people.

Another important finding of this study is the surprisingly heavy adoption of ethical protocols or "how-to" procedures for handling questions related to digital manipulation. Fully 61 percent of all respondents said their media outlet had adopted such protocols. Given the newspapers' lead in adopting digital technology, it is not surprising that they took the lead in adopting and smoothly implementing protocols. It is interesting, too, that protocols are preferred over formal written codes of ethics as about half of all respondents said their media outlet did not rely on codes to decide when and how to manipulate; of the media that do use them, newspapers again took the lead over TV (31 percent v. 13 percent).

Overall, the study's findings lend considerable support to the study's research expectations. Survey results indicated that TV news directors do tend toward more lax standards in application of the technology, and thus are more prone to its use. This is clearly evident in the way TV news directors are much less likely than photo editors (48 percent v. 91 percent) to bar absolutely manipulation of news content. At the same time, however, the TV people's responses clearly indicate a sensitivity--perhaps even a defensiveness--about aspects of digital manipulation technology that would raise long-standing complaints of critics and thwart their perceived ability to reflect or mirror reality in their news reports. This is evident in responses that indicated that, compared with photo editors, news directors were significantly (a) more inclined to say the presence of manipulation technology increases the temptation to manipulate, (b) less confident of no negative effect on news content, (c) more inclined to alert viewers to manipulation of images, (d) more bothered by a technology that so easily distorts reality when the medium is supposed to mirror it, and (f) more inclined to reject criticism that their medium values visual impact over story comprehension.

The explanation for all of this may lie in differences in the nature of each medium and the occupational ideology that goes with them. The explanation may lie in TV's natural affinity with digital manipulation technology, which plays into television's heavy dependence on the best possible visuals and its close association with the production modes and mindset of show business, where contrivance comes second nature. In a sense, then, television news professionals may face a dilemma. On the one hand, they are extremely sensitive to critics' widespread charges that television news too often blurs the line between reality and unreality. On the other hand, because of the technological biases of TV, the affinity of its news-processing routines and conventions with the production modes and mentalities of the entertainment industry, and economic pressures linked to ratings, TV news professionals are tempted toward contrivance. One wonders if digital image manipulation should be added to the list of ethical pitfalls confronting today's television journalists (news simulations, re-enactments, staged events, hidden cameras, etc.).

In the wake of these findings, it seems appropriate to urge further research as the television industry catches up with newspapers and more aggressively adopts digital image-processing technology for a variety of purposes and effects. Researchers with a special interest in the ethical implications of new technology should keep a wary eye especially on development and adoption of electronic cameras and their capacity to escape permanent preservation of the original image.

1. See Christopher R. Harris, "Digitization and Manipulation of News Photographs," Journal of Mass Media Ethics 6:3 (1991): 164-174; Edwin Martin, "Against Photographic Deception," Journal of Mass Media Ethics 2:2 (1987): 49-59; Edwin Martin, "On Photographic Manipulation," Journal of Mass Media Ethics 6:3 (1991): 156-163; William L. Rivers and Cleve Mathews, Ethics for the Media (Englewood Cliffs, N.J.: Prentice Hall, 1988); Paul Lester, Photojournalism: An Ethical Approach (Hillsdale, N.J.: Lawrence Erlbaum, 1991); Don E. Tomlinson, "Coalesce or Collide? Ethics, Technology, and TV Journalism 1991," Journal of Mass Media Ethics 2:2 (1987): 21-31; Nancy M. Davis, "Electronic Photo Manipulation: Many Are Doing It, and Editors, Photojournalists Urge Strict Ethical Guidelines to Protect Credibility," presstime, February 1992, 22-23; Shiela Reaves, "Digital Alteration of Photographs in Consumer Magazines," Journal of Mass Media Ethics 6:3 (1991): 175-181; Kurt Foss, "Digital Dilemma: Enhancement or Manipulation?" Photo Electronic Imaging, April 1992, 21-23.

2. J. D. Lasica, "Photographs That Lie: The Ethical Dilemma of Digital Retouching," Washington Journalism Review, June 1989, 22-25; Shiela Reaves, "Digital Retouching: Is There a Place for It in Newspaper Photography?" Journal of Mass Media Ethics 2:2 (1987): 40-48.

3. Harris, "Digitization and Manipulation"; Fred Ritchin, In Our Own Image: The Coming Revolution in Photography (West Hanover, Mass.: Aperture, 1990).

4. TV applications include graphics generators that allow drawing, coloring, animating, storing, and retrieving of images electronically; digital video effects (DVE) technology that allows digital manipulation of the overall video signal and produces effects that appear as spins, multi-image montages, graphic zooms, etc.; technology that allows digitizing of video tape and pixel manipulation of digital video images; and technology for digital sound sampling (the recording of actual sound coupled with its digitization and manipulation) so that, for example, a TV station can change the pitch and inflection of someone's voice. See: Tomlinson, "Coalesce"; Herbert Zettl, Television Production Handbook, 5th ed. (Belmont, Calif.: Wadsworth, 1992).

5. Martin, "On Photographic Manipulation"; Shiela Reaves, "Digital Retouching"; Brian L. Steffens, "Ethics Is a Matter of Head and Heart, Not of Technology," Quill, May 1992, 2.

6. Reaves, "Digital Retouching."

7. Shiela Reaves, "What's Wrong With This Picture? Daily Newspaper Photo Editors' Attitudes and Their Tolerance Toward Digital Manipulation," Newspaper Research Journal 13&14:4&1 (1993): 149-150.

8. Reaves, "Digital Retouching."

9. Clare Ansberry, "Alterations of Photos Raise Host of Legal, Ethical Issues," Wall Street Journal, 26 January 1989, II:1; Robert F. Brandt, "Technology Changes; Ethics Don't," presstime, December 1987, 32; Davis, "Electronic Photo"; Harris, "Digitization and Manipulation"; Martin, "On Photographic"; Reaves, "Digital Retouching."

10. Reaves, "What's Wrong."

11. Reaves, "Digital Retouching."

12. Vincent Alabiso, "The Ethics of Electronic Imaging and Photo Content," AP Log, 26 November 1990, 1.

13. Davis, "Electronic Photo."

14. Martin, "On Photographic."

15. Davis, "Electronic Photo."

16. Reaves, "Digital Retouching."

17. Patrick Boyle, "Standards for Photography's Cutting Edge," Washington Journalism Review, November 1992, 12; Ctein, "Silicon and Silver Halide: Is the Digital Age Here?" Darkroom Photography, 24-27, 71.

18. Davis, "Electronic Photo."

19. Jay Black, "Taking the Pulse of the Nation's News Media," Quill, November 1992, 31-32. For full details of this study, see Jay Black, Bob Steele, and Ralph Barney, Doing Ethics in Journalism (Greencastle, Ind.: Sigma Delta Chi Foundation and Society of Professional Journalists, 1993), 203-220. 214.

20. Patrick G. Marshall, "Software-Driven Innovation Help Newspapers Cope," presstime, April 1992, 22-29: Ctein, "Silicon"; Nancy M. Davis, "Out of the Darkroom and Into the Newsroom: Technological Advances, Newsroom Restructuring and Enhanced Skills Are Changing Photojournalists Career Paths," presstime, February 1992, 18-15.

21. Andy Grundberg, "Ask No Questions: The Camera Can Lie," The New York Times, 12 August 1990, II:1, 29; Reaves, "Digital Retouching."

22. Black, "Taking the Pulse"; Nancy M. Davis, "A 'Protocol' Suggests Ethical Guidelines for Photo Manipulation," presstime, February 1992, 24; Davis, "Electronic Photo."

23. Harris, "Digitization and Manipulation."

24. Black, et al., Doing Ethics, 205, 211;

25. Davis, "Electronic Photo," 23.

26. See Tomlinson, "Coalesce," and Robert M. Steele, "Video Ethics: The Dilemma of Value Balancing," Journal of Mass Media Ethics 2:2 (Spring/Summer 1987): 7-17.

27. See K. Tim Wulfemeyer, "Defining Ethics in Electronic Journalism: Perceptions of News Directors," Journalism Quarterly 67 (Winter 1990): 984-991. Despite its comprehensive nature, this survey does not address issues related to digital manipulation technology.

28. See Black et al., Doing Ethics, 203-220; Douglas A. Anderson and Frederic A. Leigh, "How Newspaper Editors and Broadcast News Directors View Media Ethics," Newspaper Research Journal, 13:1&2 (Winter/Spring 1992): 112-122.

29. For an explication of TV's technological biases and the occupational ideologies associated with the routines and conventions of television news gathering and dissemination, see: Neil Postman, Amusing Ourselves to Death (New York: Viking Penguin, 1985); David L. Altheide, Creating Reality: How TV News Distorts Events (Beverly Hills, Calif.: Sage, 1976); Edward J. Epstein, News From Nowhere (New York, Vintage, 1973); Herbert J. Gans, Deciding What's News (New York: Pantheon, 1979); Todd Gitlin, Inside Prime Time (New York: Pantheon, 1983); Ron Powers, The Newscasters: The News Business as Show Business (New York: St. Martin's Press); Gaye Tuchman, Making News (New York: Free Press, 1978); Ian I. Mitroff and Warren Bennis, The Unreality Industry (New York: Oxford University Press, 1989); Harry J. Skornia, Television and the News: A Critical Appraisal (Palo Alto, Calif.: Pacific Books, 1968); Sir William Haley, "Where TV News Fails," Columbia Journalism Review, Spring 1970, 7-11; Richard W. Jencks, "A Picture Isn't Always Worth a Thousand Words on TV," The Wall Street Journal, 20 August 1987, 20.

30. Postman, Amusing Ourselves; Epstein, News From; Gitlin, Inside; Robert McNeil, "The News on TV and How It Is Unmade," Harper's, October 1968, 72-80; M. L. Stein, "Bashing Broadcast News," Editor & Publisher, 25 December 1993, 13; "The News Doctors," Newsweek, 25 November 1974, 87; Dan Rather, untitled speech presented at the Radio and Television News Directors Association annual convention, 29 September 1993, Miami, Fla.

31. Postman Amusing, 87.

32. Fred W. Friendly, "On Television: News, Lies and Videotape," The New York Times, 6 August 1989, II: 1 and 27; Richard Zoglin, "TV News Goes Hollywood," Time, 9 October 1989, 98-99; Marshall Ingwerson, "Call It 'Info-tainment' or 'Docu-Schlock,' This Is Popular TV," Christian Science Monitor, 14 December 1983, 1, 44; Travis Linn, "Staging in TV News," Journal of Mass Media Ethics 6:1 (1991): 47-54.

33. Friendly, "On Television"; Richard Harwood, "Editorials of the Air," The Washington Post, 22 February 1993, 15; Elizabeth Jensen, "NBC News President, Burned by Staged Fire and GM, Will Resign," The Wall Street Journal, 1, 12.

34. Harwood, "Editorials"; Todd Gitlin, "Money Talks," American Journalism Review, September 1993, 24.

35. Richard Cohen, "Zero Tolerance," The Washington Post, 16 February 1993, 13.

36. Dusty Saunders, "TV News Directors Rank Denver as Nation's Second Best Market," Rocky Mountain News, 8 Oct. 1993, 32D.

37. The yearbook is more comprehensive than other directories (e.g., RTNDA) in that it lists by stations rather than membership of individuals.

38. Don A. Dillman, Mail and Telephone Surveys: The Total Design Method (New York: John Wiley & Sons, 1979).

39. Similar studies consistently indicate better return rates for newspaper editors compared with TV news directors; it is not unusual to see return rates for newspaper editors almost double the return rate for TV news directors. See Anderson and Leigh, "How Newspaper Editors"; Wulfemeyer, "Defining Ethics"; Reaves, "What's Wrong."

40. See David H. Weaver and G. Cleveland Wilhoit, The American Journalist (Bloomington, Ind.: Indiana University Press); Vernon A. Stone, "Changing Profiles of News Directors of Radio and TV Stations, 1972-1986," Journalism Quarterly, 64, 4 (Winter 1987): 745-749.

41. Reaves, "What's Wrong," 149-150.

TABLE 1

Comparison of Newspaper Photo Editor and TV News Director Responses on Issues Concerning Digital Manipulation of Images

Statements	Group	Means*	S.D.	t value	p**
I see no difference between conventional film and video photography and digital audio/video with respect to conveying truth; after all, the older method is fully manipulative (e.g. use of telephoto and wide-angle lens and artificial light).	PEs	2.04	1.28	-3.47	**.001**
	NDs	2.58	1.37		
It bothers me that newspapers (TV stations) aim to mirror reality in their news reports, yet adopt digital technology that effortlessly, imperceptibly distorts reality.	PEs	2.98	1.41	2.01	**.05**
	NDs	2.66	1.31		
It's wrong to alter the content of film/video/audio in any way that deceives the public.	PEs	1.40	1.03	1.52	ns
	NDs	1.24	.69		
Digital manipulation to drop out or alter backgrounds, remove/add objects, etc. should be limited to material that has no news value.	PEs	1.28	.97	-7.69	**.001**
	NDs	2.45	1.51		
Digital manipulation technology will negatively affect news content of newspapers (TV).	PEs	4.09	1.12	3.13	**.01**
	NDs	3.69	1.05		
Digital manipulation technology increases the temptation to do unethical image manipulation.	PEs	2.11	1.26	-2.15	**.05**
	NDs	2.43	1.14		
I find it disquieting that digital technology allows shadows to be corrected, sizes matched to scale, and colors and objects cloned to match perfectly.	PEs	3.05	1.42	.77	ns
	NDs	2.93	1.32		

(table continues)

Statements	Group	Means*	S.D.	t value	p**
It is wrong ethically to use digital manipulation to alter colors in any object to achieve a desired hue.	PEs	2.27	1.26	-1.79	ns
	NDs	2.54	1.3		
Too often photographers (camera people) are more concerned with "how did it look?" rather than "did the viewer understand it?"	PEs	2.55	1.35	-2.34	**.05**
	NDs	2.92	1.37		
The newspaper (TV station) should inform viewers when a photo (video/ audio) has been altered (perhaps for newspapers use of a small "A" and for TV a super or key).	PEs	2.23	1.61	3.6	**.001**
	NDs	1.66	1.06		
I worry about the new digital technology because nobody knows for sure what the original image looked like.	PEs	3.12	1.41	1.67	ns
	NDs	2.86	1.24		
My newspaper (TV station) has ethical protocols and "how-to's"--procedures for deciding whether to manipulate an image (or sound).	PEs	1.68	1.28	-3.76	**.001**
	NDs	2.26	1.32		
At my newspaper (TV station) the protocols and "how-to's" are satisfactory and are rarely, if ever, debated among people in the decision-making chain.	PEs	2.19	1.45	-3.48	**.001**
	NDs	2.8	1.52		
My newspaper (TV station) relies on a written code to determine when and if manipulation of an image (image or sound) is permitted.	PEs	2.41	1.96	-3.78	**.001**
	NDs	3.25	1.79		

*t test, two tailed. Lower means equals greater approval of statement on five-point scale: 1=strongly agree; 2=mildly agree; 3=neutral; 4=mildly disagree; 5=strongly disagree.
**Newspaper photo editors (N=136-139); TV news directors (N=150-152). The pre-set level of statistical significance was the conventional .05 test.

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OVER THEIR HEADS: THE PLAN TO USE SATELLITES TO BROADCAST HIGH-DEFINITION TELEVISION

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Abstract: High-definition television (HDTV) research began in Japan in 1968. HDTV was conceived as using direct broadcast satellites, a plan pursued by CBS in America. However, the network found the plan too costly and probably alienating to its affiliates. Had the network pursued HDTV, the United States might already have an operating system, as Japan does. However, technological improvements that have been made in the interim might not have been realized.

OVER THEIR HEADS: THE PLAN TO USE SATELLITES TO BROADCAST HIGH-DEFINITION TELEVISION

I. Introduction

The effort to establish a worldwide transmission standard for high-definition television (HDTV) has some elements in common with earlier struggles over television standards. One of those contests was the battle over the standards now known as NTSC, PAL and SECAM.[1] However, a historical look at the development of HDTV in the United States with reference to key developments around the world will show that the current conflict and outcome are different in several respects. The literature on HDTV appears to be lacking such an analysis, and the published work generally has not been presented in the academic journals in the communication field. What has appeared has been a piecemeal historical view at best. Indeed, little HDTV scholarship of any kind has been published beyond the numerous papers that have appeared in technical journals, a few economic analyses, and articles in the popular and trade press during the past 20 years.

The need for more work in the social, political and policy areas was made clear by HDTV pioneers Blair Benson and Donald Fink in their primarily technical book:

> The ramifications of HDTV have expanded beyond technology and marketing into the realm of politics. The political and legislative questions raised by the push for "high-def" promise to be far more difficult to resolve than the

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[1] The acronyms are used much more commonly than the full names. NTSC stands for National Television Systems Committee. That group established the American standards for broadcast of black and white television in 1941 and color television in 1953. Sydney W. Head & Christopher H. Sterling, Broadcasting in America: A Survey of Electronic Media 62, 69 (6th ed. 1990). The NTSC standard prevails in North and Central America, much of South America and in Japan. PAL is an acronym for Phase Alternation Line. It is the standard that is dominant throughout the world. SECAM (système electronique couleur avec mémoire) was developed in France and is the standard there, in francophone Africa and in the countries of the former Soviet Union and former Eastern Bloc nations. K. Blair Benson & Donald G. Fink, HDTV: Advanced Television for the 1990s 1.4-1.6 (1991).

> technical problems. From Capitol Hill to the Pentagon, HDTV has become the lightning rod for marshalling concern over the future of "good old" American leadership.[2]

As the United States moves closer to adopting a standard that could be used worldwide, it becomes increasingly important to understand the historical development of HDTV. Such knowledge may influence policy decisions the United States is on the threshold of making. After all, the current American television standard has remained virtually unchanged, except for the addition of color capabilities, for more than 50 years. And even if HDTV parameters and policies appear to have stabilized for the moment,[3] it still remains useful to document a portion of the policy process.

As originally conceived by its Japanese developers, HDTV was to be broadcast by satellite direct to homes.[4] This plan also was pursued by the American television network CBS.[5] Although the network ultimately dropped this early idea, if it had been carried out it is likely the United States already would have analog HDTV broadcasts, as Japan has.[6] But what is more important, technical development of HDTV likely would have stagnated, and the digital system under consideration around the world may not have materialized. Because recent research has produced and improved numerous aspects of digital HDTV, most notably video data compression, if the analog standard had been adopted many spinoff technical advances might not have been realized. International trade and network-affiliate relations, to name just two areas, would look markedly different today if the original plan for analog HDTV broadcast direct to the home had been pursued in the United States. Thus, reviewing the development of HDTV from a policy as well as technological standpoint is useful.

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[2] Benson & Fink, supra note 1, at xiii. Shortly after the book was published a reviewer noted that because of the fast-changing nature of HDTV development work, the book was outdated the day it was published. However, the text still provides "an excellent tutorial," especially for those seeking a historical view of the technical aspects of HDTV. James E. Carnes, HDTV on the Fly, IEEE Spectrum, Aug. 1991, at 6 (book review).

[3] HDTV Group Endorses Computer-Compatible 1,080-line HDTV Format, Communications Daily, Nov. 9, 1993, at 2 [hereinafter Endorsement]. The Advisory Committee on Advanced Television Systems (ACATS) established parameters for an American HDTV system that would have 1,080 active lines by 1,920 vertical columns of square pixels, which would allow compatibility with computer displays. In addition the FCC's advisory group also settled on a video compression program known as MPEG-2, Dolby surround sound, and an option to use either interlaced or progressive scanning in each set.

[4] See infra note 31 and accompanying text.

[5] See infra note 56 and accompanying text.

[6] High-Definition TV in Japan, Wall St. J., Nov. 26, 1991, at A11.

II. Background

The history of television encompasses the entire 20th century and more. Even though black-and-white television is largely thought of as a post-World War II phenomenon, the technical development of the medium began in the 1870s with the discovery of the light-sensitive properties of selenium and suggestions that visual images could be sent by wire.[7] However, it was not until the 1960s when color television began its rapid diffusion among the public (first in the United States and later in other developed countries) that television became a truly ubiquitous mass medium.

After the basic research on television demonstrated the feasibility of broadcasting pictures and sound, there were three significant developmental periods. These were the spinning disk mechanical televisions of the 1930s, electronic television, which was demonstrated in 1936, and the post-World War II rise of commercial television in the United

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[7] George Shiers, Historical Notes on Television Before 1900, SMPTE J., Mar. 1977, at 129.

States.[8] The third phase was characterized by the standard-setting process encouraged by the FCC that involved the two National Television Systems Committees. In 1941, the first committee established the black-and-white television standard that is still in use today. In 1953, a subsequent NTSC panel established the color standard for the United States and adopted by numerous other countries.[9] The present HDTV standard-setting process may be considered equivalent to a third NTSC.

General public acceptance of television was made easier by the early adoption of technical standards and by the historical fact of the intervention of World War II.[10] The pause in the development of television that resulted from the war allowed for the consolidation of technological advances. Thus, the adoption of television was partially eased by a fluke of history. No such event helped smooth the way for the introduction of color. Indeed, the development of color was characterized by the fits-and-starts nature of its development and adoption in the United States. At first, a system developed by CBS was offered. It was an apparently technically superior method of color transmission. However, it was not compatible with early black and white television sets, which in the immediate post-war era already had begun to sell well in the United States, and it required more spectrum than had previously been allocated for television broadcasts. Because of the entrenched base of television sets already in the United States, it was politically and economically important that their owners not be disenfranchised by the adoption of an incompatible color transmission standard. Therefore, after much debate over technical merits and with much political arm twisting, a signal that could be received by both black-and-white and color sets and could be transmitted within the customary 6 megahertz (MHz) channels was adopted in 1953 as the American standard.[11]

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[8] 4 International Encyclopedia of Communications 217-221 (Erik Barnouw ed., 1989).

[9] Donald G. Fink, Perspectives on Television: The Role Played by the Two NTSC's in Preparing Television Service for the American Public, 64 Proceedings of the IEEE 1322, 1322-31 (1976).

[10] For general histories of television see, e.g., Sterling & Head, supra note 1, International Encyclopedia of Communications, supra note 7, Les Brown, Les Brown's Encyclopedia of Television (1982), George Gerbner & Marsha Siefert, World Communications: A Handbook (1984), and Robert V. Hudson, Mass Media: A Chronological Encyclopedia of Television, Radio, Motion Pictures, Magazines, Newspapers, and Books in the United States (1987).

The situation in a war-ravaged Europe was quite different. Because of the shattered economies, a large base of television sets had not yet been established, and the standard-setting process ceased for the duration of the war even while technical advances that could affect television continued. By the late 1950s a French engineer had developed a new color television system, SECAM, that was technically superior to the American NTSC standard. Shortly afterward, a German firm developed PAL, a system combining the best elements of both systems.[12] These international conflicts over standards and the differing electrical systems[13] are the root reasons for the existence of the different television standards currently found around the world. Further, because Europe and Asia are physically isolated from the United States—unlike Canada and Mexico—there was little incentive to adopt a system that would be compatible with American signals.

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[11] Head & Sterling, supra note 1, at 68-69.

[12] James G. Savage, The Politics of International Telecommunications Regulation 178, 188-89 (1989).

[13] The United States and Japan use 120 volt electrical current alternating 60 times per second (or more precisely, 59.94 cycles per second—a difference that has some implications for the development of HDTV). Most of the rest of the world uses 220 volt current alternating at 50 cycles per second, also known as 50 Hz.

Much of the debate over HDTV has been cast in terms of similarities and differences with these historical turning points in the development of television.[14] In the early 1950s, the primary issues facing television engineers were electromagnetic spectrum use, especially in the ultra-high frequency (UHF) band, and refining the black-and-white set. With the adoption of a color standard, improving color television became a greater interest. When color was introduced, vacuum tubes still were dominant. Partly for this reason, but also because of the lack of uniform set design and the lax enforcement of standards, many consumers considered color quality to be quite poor.[15] Hence, much of the literature in the latter 1950s and throughout the 1960s focused on improvements to equipment to render more true-to-life color. The introduction of solid-state electronics helped considerably in solving the color-shifting problems as well as reducing the cost of television sets. For many consumers this appeared to solve the major problems of color television.[16]

As color television was becoming widely adopted by consumers, an article by an influential American electrical engineer discussed the future of television from a technological perspective.[17] Ray Wilmotte, who was with the Federal Communications

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[14] Indeed, even a cursory look through some of the technical literature will show rather quickly what was of significance to the scientists and engineers working on television. Two of the most useful publications in this vein are IEEE Transactions on Consumer Electronics and the SMPTE Journal and their predecessors. Both journals continue to be in the forefront of technological developments by publishing numerous articles on HDTV.

[15] Television engineers often said in jest that NTSC stood for Never The Same Color.

[16] Eugene Lemke, History of Television Receiver Technology (1962 to Present), CE-30 Transactions on Consumer Electronics 24, 24 (1984).

[17] Raymond M. Wilmotte, Technical Frontiers of Television, BC-22 IEEE Transactions on Broadcasting 73 (1976). The article was based on the author's three-volume study, Technological Boundaries of Television, that he prepared for the FCC.

Commission (FCC) when the article appeared in 1976, discussed three aspects of television that deserved to be examined for possible improvement: the quality of the picture, the bandwidth requirements, and the analog-digital dichotomy. Although Wilmotte never directly mentioned high-definition television, or "advanced television" as it is sometimes called, all three issues he examined have important implications for HDTV. Indeed, he proposed that high-resolution displays have 1,100 lines of resolution, a figure remarkably similar to that which ACATS has endorsed.[18] In a prescient conclusion, Wilmotte noted:

> Technologists have provided society with an increasingly wide range of options for the delivery of television. Society is faced with the process of dealing with the social changes that this rapid progress implies, and also with how the needs and aspirations of society can best be satisfied in making use of this powerful means of communications.[19]

It is expressly the broader issues related to HDTV, not the technological ones, that are the most intractable.

About the same time as Wilmotte's article appeared, Takashi Fujio of Japan recognized the problems and opportunities of modern television manufacture when he published "Shortcoming of a Present Color TV System and Prospect of High-Definition TV

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[18] Lines of resolution refer to the detail a picture is able to display. The current NTSC television standard used in the United States is based on 525 lines (although only 483 lines are used for picture display purposes). The PAL and SECAM standards use a 625-line display. (Before the advent of color, SECAM used an 819-line standard.) The proposed American standard for HDTV would have 1,080 lines vertically. Endorsement, supra note 3, at 2. Although there are numerous levels currently available, computer displays, by way of comparison, commonly have 768 horizontal lines, with higher resolution displays having 1,024 lines and sometimes more. It may be a somewhat unfair comparison but pictures in newspapers typically use halftone screens of 85 lines per inch. Books and magazines can be printed with even finer screens. Because the size of printed pictures varies, the number of actual lines changes; the total number of lines displayed on television and computer displays do not change as the picture gets larger or smaller. Thus, whereas a television image appears fuzzier the relatively larger it gets, printed halftone images gain detail as they get bigger because more lines are used.

[19] Wilmotte, supra note 7 at 80.

System."[20] Development of HDTV had begun in 1968 under Fujio, the man who appears to be the father of HDTV, at the Japan Broadcasting Corporation (NHK).[21] Publications describing these efforts appeared at least as early as 1971.[22] Much of this early work in Japan virtually has defined the limits of subsequent HDTV research. For example, Fujio studied various aspect ratios (the proportion of the screen width to the screen height) suitable for HDTV. The aspect ratio across all three television standards (NTSC, PAL and SECAM) has been 4:3. This seems to be derived from two bases. First, the early cathode-ray picture tubes had displays that were small and round, because this was the easiest shape in which to control the electron beam.[23] Second, as television tube manufacturing and electron beam control progressed, the NTSC adjusted proportions to match those of the slightly-more-horizontal-than-square movies of the time.[24] Only later did the film industry, in an effort to distinguish itself from television, change to an even wider screen.[25] This issue is important for HDTV because broadcast television and cable carry so many movies.

Research in Japan on viewer perceptions found that a viewing angle of about 30 degrees significantly increased the perceived realism of the image. Put another way, Fujio found that although NTSC sets are optimally viewed from a distance of about seven times the screen height (an angle of view of about 10 degrees), high-definition sets are best viewed at about three times screen height (30 degrees).[26] The importance of viewing angle to realism was something filmmakers apparently had discovered when they switched to widescreen movies in the 1960s. So Fujio decided an aspect ratio of 1.7:1 and 1125 lines of resolution would provide the requisite clarity.[27] Despite nearly 25 years of research on HDTV, this is remarkably close to the American proposal of 1.78:1 (often described in whole numbers as 16:9) and 1,080 horizontal lines.[28] Certainly numerous factors went into these decisions, but the similar outcomes are striking nonetheless.

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[20] Takashi Fujio, Shortcoming of a Present Color TV System and Prospect of High-Definition TV System, TGIE, IE76-9 (May 1976).

[21] Benson & Fink, supra note 1 at 7.1.

[22] See, e.g., T. Ohtani and T. Kubo, An Investigation of Shape of Screen for a High Quality Television System, 14 NHK Technical Reports, No. 5, (1971).

[23] A.G. Jensen, The Evolution of Modern Television, SMPTE J., May 1991, at 357-70 (article originally appeared in Nov. 1954 J. SMPTE).

[24] Hugh Carter Donahue, Choosing TV of the Future, Technology Review, Apr. 1989, at 30-40, 34.

[25] In the case of Cinerama, to take an extreme example, the horizontal screen dimension was expanded to three times the screen height (3:1). CinemaScope uses an aspect ratio of 2.35:1. John E. Johnson Jr. & John E. Johnson Sr., How Wide is Too Wide?, Video, Dec. 1992, at 116.

The most important consideration for research into HDTV has been and continues to be bandwidth requirements. Bandwidth is the amount of electromagnetic spectrum required to transmit a signal. For NTSC the bandwidth required by each television station is 6 MHz. For PAL the requirement is 8 MHz. The extensive spectrum requirements of television continue to be the subject of much debate.[29] Other over-the-air services, such as private radio (also known as land-mobile radio, such as is used by taxi dispatchers, police and fire departments, railroads and more recently cellular phone service) long have coveted the large amount of spectrum devoted to television.[30] As originally designed, the Japanese HDTV system required about 30 MHz for each station. When HDTV was being developed, the only way to conceive of devoting that much spectrum to television was to use microwave frequencies, which were underutilized. Such use of microwaves fit in neatly with a satellite broadcast system that was simultaneously under development. Thus, the Japanese HDTV broadcast system was intended from the outset to be apart from and a supplement to the terrestrial broadcast television system.[31] And this is where the American broadcast industry enters the picture.

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[26] Takashi Fujio, High-Definition Television Systems, 73 Proceedings of the IEEE 646, 647 (1985).

[27] Modern movies are made in a variety of formats, but the Academy of Motion Picture Arts and Sciences endorses a standard of 1.85:1, which is probably the most common proportion.

[28] Endorsement, supra note 3, at 2.

[29] See, e.g., Daniel Pearl, Broadcasters To Seek Wider Spectrum Use, Wall St. J., Feb. 2, 1994, at B1, B5.

[30] By way of comparison, one channel of television occupies about 600 times the amount of spectrum used by a single AM radio station.

III. Moving to America

After a decade of development in Japan, HDTV was demonstrated in the United States at the annual Society of Motion Picture and Television Engineers conference in San Francisco in February 1981.[32] By this time, HDTV was being studied from two angles. The first was as a broadcast standard, as the Japanese had been doing. But others, primarily from the television production and news communities, saw video as a vehicle to reduce the costs of production.[33] It was clear that HDTV could play a role. Donald Fink, who was then chair of the Society of Motion Picture and Television Engineers' high-definition television study group, predicted in 1981 that movie producers would shift to HDTV videotape within two years to save time and money.[34] Moreover, film director Francis Ford

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[31] Kenji Hori & Toshihiko Numakura, History and Future Trends in the Development of HDTV Technology in Japan, 2 International J. of High Speed Electronics 1-19, 13-14 (1991).

[32] Television Technology, SMPTE J., May 1982, at 458.

[33] Film Can Become Thing of the Past for Television, CBS Engineers Tell SMPTE, Broadcasting, Oct. 25, 1976, at 47-48.

[34] Andrew Pollack, Sharper Image for Television, N.Y. Times, July 16, 1981, at D2.

Coppola was in the forefront of this effort, having been one of the first Westerners to be introduced to HDTV in Japan and subsequently to use it both experimentally and as a production tool. He was so impressed that in 1981 he said he would not make any more movies on 35mm film.[35] This split personality for HDTV—its use in both production and broadcast—has been both a hindrance and a help to its development. The use of HDTV in real-life productions has aided engineers in working out some of the problems with the medium. But by shifting the focus from the consumer, the benefits of a sharper television picture have been lost in the rush to save production costs.

In any case, CBS seems to have led American companies in investigating HDTV, at least in the early years. Part of the reason for the company's interest clearly was to lower program production costs. The vast majority of television programming was (and still is) shot on 35mm film and then transferred to videotape for transmission.[36] Shooting and taping with high-definition equipment could reduce the cost of special effects and cut post-production costs generally by as much as 15 percent.[37] However, another reason for the network's interest in HDTV may have been that it was trying to replay the battle over color television standards, which it lost to RCA in the early 1950s. CBS had what some regarded as a color system that was in some ways superior to RCA's system.[38] But in 1953 the FCC selected the RCA-developed color system, ostensibly because it was compatible with monochrome television already in use at the time. With HDTV, if CBS could secure the American rights, and if HDTV became the consumer product its visionaries expected it to be, then CBS would remain in a strong position among the American networks, just as RCA was able to do years earlier with the color standard. Indeed, some CBS executives, most prominently vice president Joseph Flaherty, continue to be deeply involved in the development of an American HDTV standard.[39] After witnessing a 1981 exhibition of a fully developed Sony HDTV system, Flaherty "exclaimed enthusiastically that the development had 'brought high-definition television within the grasp of the consumer by 1986.'" He also said the network would use the equipment to show movies within two years.[40] This was undoubtedly a response to the growth of the cable and rental videotape movie markets. Even if his timing was off, his enthusiasm for HDTV apparently has not diminished.[41] But what he did not mention was another aspect of the network's interest in HDTV: the use of satellites.

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[35] Nicholas Mokhoff, A Step Toward 'Perfect' Resolution, IEEE Spectrum, July 1981, at 58. For a somewhat more critical examination of the production issues, see Brian Winston, HDTV in Hollywood: Lights, Camera, Inaction, Gannett Center J., Summer 1989, at 123.

[36] It was estimated that 80 percent of prime time programming originated on 35mm film during 1985. Edward J. Blasko, Motion Pictures, SMPTE J., Apr. 1986, at 413.

[37] Ronald K. Jurgen, High-Definition Television Update, IEEE Spectrum, Apr. 1988, at 62.

[38] The Present State of Color Television: Report of the Advisory Comm. on Color Television to the Senate Comm. on Interstate and Foreign Commerce, 81st Cong., 2nd Sess., 30 (1950).

For much of the time that television has been part of the American scene, there has been concern over the preeminent position of the networks. The recurring theme of network dominance is well documented,[42] but it is useful to recall that much of the problem stemmed from the FCC's Sixth Report and Order[43] of 1952, which established a two-tier table of frequency allocations, with some stations in the VHF (very high frequency) portion of the spectrum and others in the UHF (ultra high frequency) portion. Most of the network-affiliated stations were grandfathered into VHF channels (channels 2 through 13). When spectrum did not allow a new channel to be allocated in the VHF band, it was put into the UHF band (except in a few markets where intermixture was not allowed and all stations were given UHF licenses). These UHF stations were generally second-class citizens in the television world. This was because VHF was technically superior to UHF (primarily because of the physical laws of radio propagation), and because networks, which provided the programming most viewers watched, historically were affiliated with VHF stations. Although the fact that this contributed to network dominance[44] long has been recognized, it is only with the prospect of HDTV that the distinction between broadcasting by VHF and UHF stations could be overcome politically.[45] This could happen if the FCC's plans for introducing HDTV proceed as the agency has outlined.[46] Even though it never occurred, the move to consolidate television broadcasting long had been forecast:

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[39] Flaherty is chair of the planning subcommittee of ACATS. ACATS was formed by the FCC to advise the commission on high-definition television matters.

[40] Mokhoff, supra note 35, at 56.

[41] In a slight change of heart on production matters, Flaherty recognized the value of 35mm film when he said at a 1993 lecture: "Programs can be shot on the same film using the same cameras already used today to shoot normal television programs. This gives the United States an advantageous 'start-up' position, and enables it to begin a rapid and efficient changeover to wide screen HDTV." J.A. Flaherty, HDTV — How, Why, & When, Shoenberg Lecture for the Royal Television Society, London, Nov. 4, 1993.

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[42] See, e.g., Robert Britt Horwitz, The Irony of Regulatory Reform: The Deregulation of American Telecommunications (1989) and Head & Sterling, supra note 1, at 69-73.

[43] Sixth Report and Order, 41 FCC 148 (1952).

[44] Other factors contributing to the limited number of networks can be summarized as: insufficient total frequency allocated television; the policy of localism, in which at least one channel is reserved for each community; and the policy of intermixture, in which a mix of VHF and UHF channels serve the same community. Stanley M. Besen, et al., Misregulating Television 14 (1984) (citing Thomas L. Schuessler, Structural Barriers to the Entry of Additional Television Networks: The Federal Communications Commission's Spectrum Management Policies, 54 S. Cal. L. Rev. 875-1000 (1981)).

[45] Some will argue that cable has extinguished the differences between VHF and UHF broadcasts. This is partially true. But cable does not affect the distinction for the sizeable minority of households that do not receive or chose to receive cable, and a certain historical embeddedness perpetuates a second-class image for many UHF stations.

> The opinion among many broadcast people, as I understand it, is that it is only a matter of time, perhaps ten years, before UHF equipped receivers will be so universally in service that the relocation of television service to the UHF channels will be politically possible, if not in fact probable.[47]

In addition to the prospect of consolidating television in the UHF band, other delivery services that would erode network dominance were on the horizon. These included cable, videotape, and microwave distribution systems.[48] Thus, the networks, and especially CBS, had good reason to seek new technical means to continue their dominance. And one was just over the horizon, literally.

IV. The Rise of Satellites

The first commercial communications satellite was launched in April 1965. Early Bird and its immediate progeny did not and were not intended to provide direct-to-home television service.[49] But it was not long before home video service was envisioned. On Sept. 30, 1975, a boxing match in Manila in which Muhammad Ali knocked out Joe Frazier

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[46] The FCC has mapped out a 15-year transition from NTSC to HDTV during which time each station would be allocated a second channel on which the HDTV signal would be simulcast. Those simulcast channels would be primarily UHF channels. At the end of the transition period all television broadcasting would be shifted to the UHF band, and the VHF band would be reallocated by the FCC to other services. Notice of Proposed Rule Making, 6 FCC Rcd 7024 at 7034-45 (1991).

[47] Donald G. Fink, How Many Channels? Perspective on Some New Challenges for Broadcast Engineers and Managers, BC-13 IEEE Transactions on Broadcasting 101, 102 (1967).

[48] Head & Sterling, supra note 1, at 80-105.

[49] Wilbur L Pritchard, Satellite Communication—An Overview of the Problems and Programs, 65 Proceedings of the IEEE 294, 295 (1977).

was broadcast by satellite to the continental United States using the Westar I satellite. But because most homeowners did not have receiving dishes, it is likely that few people saw the fight directly. However, Home Box Office provided the program for cable operators which then distributed it to their customers.[50] The success of satellite-to-cable-to-home broadcasts and the falling prices of home receiving equipment prompted some to think about direct-to-home broadcasts. In 1980, the FCC began an inquiry into direct broadcast satellites (DBS).[51]

The Japanese began work on an experimental satellite broadcast system in 1972. This effort was begun by the Ministry of Posts and Telecommunications in cooperation with NHK.[52] The first direct broadcast satellite and tests using DBS technology in Japan were carried out starting in November 1978 and lasted several years.[53] Subsequently, Japan launched two operational satellites that gave NHK 24-hour-a-day nationwide satellite coverage as of July 1987. Through its experimental programs, NHK developed in 1984 a way to transmit HDTV signals using these satellites. However, satellite broadcasting in Japan did not come without problems. Commercial broadcasters felt threatened by the success of the DBS experiments and the growing commercial nature of NHK itself. Thus, they have tried to thwart further satellite broadcasting, albeit with limited success.[54] Indeed, in late 1991 NHK began satellite broadcasts of eight hours of HDTV programming each day.[55]

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[50] T. Humphries, Direct Broadcast Satellite (DBS)—A Historical View From Sputnick to Now, CE-30 IEEE Transactions on Consumer Electronic at xxxii, xxxiii (1980).

[51] Notice of Inquiry, 45 F.R. 72719 (1980).

[52] Ken-ichi Tsukamoto and Nubuo Imai, Technical Aspects of the Japanese Broadcasting Experiments, BC-24 IEEE Transactions on Broadcasting 81 (1978). NHK also was developing HDTV in Japan, beginning in 1968.

[53] Takashi Fujio, High-Definition Wide-Screen Television System of the Future—Present State of the Study of HD-TV System in Japan, BC-26 IEEE Transactions on Broadcasting 113 (1980).

[54] Roya Akhavan-Majid, DBS Policymaking in Japan: An Interpretive History, Telecommunications Policy, Dec. 1989, at 363.

While NHK was planning its satellite service, CBS (along with RCA and others) was seeking FCC approval to transmit from satellite to home. CBS is singled out because its application involved three channels of high-definition television, one of which would be a feed to the network's affiliates. At the time, it was noted that DBS would provide additional competition for both cable services and local terrestrial broadcasters.[56] Fifteen months later the FCC approved CBS's application along with six others, bringing to eight the number of companies authorized to begin DBS construction.[57] During the next year, CBS then refined its plans for HDTV service. The service would include four satellites, two for each half of the continental United States. Each satellite would have six channels, giving 12 viewable channels in each region. It became clear in the network's pronouncements that it saw cable as a major threat. In a statement issued in conjunction with its satellite partner, Satellite TV Corp., the network said, "A well-financed, multiple-channel DBS service—particularly one with HDTV capacity—offers the prospect of providing a nationwide pay-television alternative to cable."[58] But if HDTV were to be offered, it would require two satellite channels for each HDTV signal.[59] That would reduce the total number of DBS channels to six serving each half of the country. Each HDTV DBS signal would require 16 MHz, but the signal would be compatible with NTSC receivers if a special converter were used.[60] If CBS wanted to maintain its dominant position in broadcasting it is difficult to conceive of a better way to do it than by cornering the market on a limited number of satellite transponders.

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[55] High-Definition TV in Japan, supra note 6, at A11.

[56] Andrew Pollack, CBS and RCA Seek New Broadcasting: Satellite to Home, N.Y. Times, July 17, 1981, at D4.

[57] 7 Companies Win Satellite Permits, N.Y. Times, Nov. 5, 1982, at D5.

[58] 101 & 148 Degrees: CBS & STC Outline Plans for Joint DBS Venture; Financial Details Still Cloudy, Communications Daily, Jan. 10, 1984, at 1.

[59] Notebook, Communications Daily, Jan. 11, 1984, at 4.

However, less than six months later CBS abruptly dropped all plans for DBS service. The network was not very forthcoming in its reasons for backing out of the new broadcast initiative, citing only a proprietary "exhaustive investigation." Company Vice President James Rosenfeld went on to say:

> We believe that DBS can provide new and diverse types of services to the public, especially in the area of high-definition TV. CBS intends to continue its efforts to stimulate the development of HDTV. But some open questions and the risks involved in the new and challenging DBS business led us to conclude not to enter this business.[61]

At about the same time, RCA and several of the other DBS applicants also dropped plans to build DBS systems. One industry analyst said the technology was too expensive and the risks too great for a company to justify the investment in satellites. One company estimated the cost of a turn-key satellite broadcast system would be $500 million to $800 million. "It's another technology in search of a marketplace," the analyst said.[62]

What went largely unsaid was who the winners and losers were. In this case it seemed that if the network were going to start beaming programming directly to viewers' homes, the middleman—in this case the local network affiliate—would be cut out. Since the affiliates give the network access to the millions of homes that advertisers seek to influence, it behooved the network to keep the affiliates' needs in mind. Although the affiliates prevailed over the network, this allowed cable and other alternative providers of programming to make further inroads into the network and affiliate markets. But in 1988, Flaherty told a meeting of the network's affiliates board:

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[60] CBS Breakthrough on HDTV Compatibility, Broadcasting, Sept. 26, 1983, at 77.

[61] Risky Business: CBS Cancels All DBS Plans; Comsat Unit Seen in Serious Trouble: GTE Reported to be Considering Taking Stake in USCI, Communications Daily, June 29, 1984, at 1.

[62] David W. Sanger, Satellite TV Systems Seen in Doubt, N.Y. Times, July 12, 1984, at D1.

> Recognizing that VCRs, Video Discs, Cable, and future DBS services will be able to deliver HDTV with fewer spectrum (or bandwidth) constraints than broadcasting, we must ensure that terrestrial broadcasters have a preeminent position in the HDTV landscape, however difficult that may seem today. We must achieve competitive parity at the outset, and, equally important, we must maintain that parity as HDTV evolves and improves with time.[63]

Thus, for richer or for poorer, the networks—and CBS in particular—were inexorably linked with their affiliates. They recognized that they could not go over their heads, either using satellites any other emerging technology.

V. Other frames for other times

There are other frames for examining the HDTV decision process. For example, Rhonda Crane has written about the political process by which international color television standards were chosen.[64] In her book and article she describes the negotiations involved in selecting a color television standard for Europe in the 1960s. France, for reasons of national pride as well as economic incentive, wanted a system that it had designed. If the French SECAM system were chosen, French companies either would make the televisions Europe and most of Asia would use or would receive royalties on the patent rights for sets made by others using French technology. Either way, France would win. However, other European nations favored a different system. France was not able to persuade Germany in particular to use the French system, and German interests developed the PAL system in response. The rest of Europe went along with Germany, and France would have been shut out of the television manufacturing business except that it persuaded the Soviet Union to adopt the SECAM system. Thus, Europe, Asia and Africa were left with two incompatible television systems. There are strong parallels between later developments in HDTV, in which the Europeans sought to stymie the Japanese from imposing their HDTV system on the world,[65] and the struggle over color standards that Crane describes.

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[63] Flaherty, supra note 41, at 5.

[64] See, Rhonda J. Crane, Communication Standards and the Politics of Protectionism: The Case of Colour Television Systems, Telecommunications Policy, Dec. 1978, 267, and Rhonda J. Crane, The Politics of International Standards: France and the Color TV War (1979).

A similar analysis comes from Adam Watson Brown, who argues that the Japanese strategy of pursuing a world standard for HDTV is an example of "triad strategy."[66] He takes the theme from the book Triad Power by Kenichi Ohmae.[67] The reasoning is that consumers in the three major trading regions (Japan, Europe and the United States) need to be treated as one market for any company with global aspirations. One way to do that is to form cooperative agreements with local companies. Once a product, such as HDTV, is established in the three key markets, it will become a de facto world standard. Such a standard will lead to manufacturing spinoffs that increase the strategic importance of the original development. Clearly there were elements of this strategy in Japan's development of

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[65] Richard Jay Solomon, HDTV: Digital Technology's Moving Target? InterMedia, Mar.-May 1990, at 58-61.

[66] Adam Watson Brown, The Campaign for High Definition Television: A Case Study in Triad Power, Euro-Asia Business Rev., Apr. 1987, at 3-11.

[67] Kenichi Ohmae, Triad Power: The Coming Shape of Global Competition (1985).

HDTV and its subsequent relationship with CBS and other American companies. What thwarted the strategy was the insistence by European nations on developing their own HDTV system.[68]

Along the same vein as Crane's and Brown's analyses is a view of HDTV from a European trade perspective. For example, in a critique of the European strategy on HDTV, Paul Slaa suggests that by linking HDTV with DBS, Europe has forsaken the production market for the consumer market.[69] He views the production side of HDTV as potentially more profitable at a sooner time than the broadcasting side. Because the European strategy was more evolutionary than the Japanese version of HDTV, there were greater chances that at some point a disjunction between some of the elements would develop; for example, satellites may be lofted in anticipation of HDTV that are not able to carry future versions of HDTV. Also, by focusing on consumer-oriented broadcasting, the European Community was ignoring myriad niche uses of HDTV (such as medical imaging, videoconferencing and remote manufacturing) that could be tested in the marketplace at lower costs—both real and social—than could HDTV carried by DBS.

Similar analyses from an American perspective also have been written.[70]

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[68] This analysis seems worthy of further consideration because the "triad strategy" may not directly apply in situations involving international regulatory bodies, as is the case with broadcasting.

[69] Paul Slaa, HDTV as a Spearhead of European Industrial Policy, 8 Telematics and Informatics 143 (1991).

[70] See, e.g., Michel Dupagne, High-Definition Television: A Policy Framework to Revive U.S. Leadership in Consumer Electronics, 7 The Information Society 53 (1990), and Jean-Pierre Coffinet and Joseph Nemec, Jr., The Strategic Path for Achieving Market Leadership Within an Innovation-Driven Industry—The HDTV Case Example, 22 Interfaces 49 (1992).

VI. Conclusion

One perspective on analyzing the development of HDTV is that the technology was pursued originally as a way for television networks to maintain their hegemonic control over television. With the introduction of cable television, laser disks, VCRs and even computer games, the networks were in danger of losing their "franchise." By exploiting the technology of satellites the networks would have been in a better position to continue to dominate television. Thus, network endorsement of HDTV broadcasting should be viewed not only as part of a trade issue (although that was certainly an important component of HDTV's use as a production and distribution tool) but as a way to maintain control over the television audience. The use of satellites, at least in the early part of the development of HDTV, was a likely option because there was insufficient spectrum for HDTV to be broadcast within the standard VHF and UHF channels. The corollary of satellite use was that there would be a limited number of HDTV channels—as few as six HDTV channels per satellite. Therefore, a program supplier would need to reach a broad audience to make the most profitable use of satellite technology. Whereas the cable television companies were adept at offering niche programming, the networks were ideally suited to exploit satellites' limited resources. However, this strategy flew directly in the face of the FCC's stated preference for localism. If the cost of DBS had not thwarted CBS and RCA, it is possible that the FCC would have taken some action to promote diversity in programming. Indeed, in retrospect, it seems likely that by the early 1970s the FCC should have been at least as concerned with the prospects for the growth and influence of cable as it had been with network dominance. And promoting competition among delivery media, for example by adding direct broadcast satellites to the broadcasting mix, may have been part of a long-term strategy to keep power centers—as the networks had once been—from forming in the future.

After the networks dropped DBS, terrestrial broadcasters, primarily those in large markets, adopted the HDTV cause in an attempt to keep from losing unused UHF spectrum to land-mobile radio services. Indeed, the ostensible reason given by the FCC for investigating HDTV initially was the petition by the broadcast industry asserting that HDTV would require spectrum beyond that used by NTSC television.[71] The terrestrial broadcasters' strategy appears similar to the network strategy vis-a-vis competition. In this case the competition was for spectrum rather than for viewers, but the issue of hegemonic control was otherwise similar.

As HDTV developed, the trade issue surfaced in the United States as it had in Japan and Europe. This eventually supplanted network control and spectrum scarcity[72] as the raison d'etre for HDTV. But as work on HDTV progressed, technical advances in the United States such as digitization and data compression[73] have made the spectrum issue less compelling. As it became clear that HDTV could be broadcast over 6 MHz channels the same as terrestrial television, there was no longer any overriding need to link HDTV with

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[71] Notice of Inquiry, 2 FCC Rcd 5125 (1987).

[72] It now appears that spectrum scarcity may no longer be an issue. Indeed, with digitization and new technologies better able to exploit extremely high frequencies there may, in fact, be a surplus of spectrum.

> After decades of treating the broadcast spectrum as a scarce commodity worth its frequency in gold, many experts now say one of the core assumptions underlying the high price of the airwaves is becoming increasingly untrue. Far from a scarcity of frequencies, they say, advances in technology have ushered in an unprecedented abundance of new capacity.

Edmund L. Andrews, For Sale. Cheap. Your Own Piece of the Airwaves., N.Y. Times, Mar. 27, 1994, at 6E.

[73] Robert L. Rose, How U.S. Firms Passed Japan in Race to Create Advanced Television, Wall St. J., July 20, 1992, at A1, A4.

DBS, with the networks or with local broadcasters. With those links severed, HDTV was free to be associated with myriad media. However, the same digitization and compression that freed HDTV from DBS, the networks and local broadcasters also allowed digitized NTSC-quality television to be broadcast in narrower channels. And that is the genesis for the much-discussed 500-channel cable system of the future.[74]

In the end, the networks (and, it appears, local broadcasters) were victims of the Law of Unintended Consequences. Once the HDTV card was played, the game was changed forever. If the networks had pursued satellite distribution, they might have remained the dominant force in broadcasting. However, by pursuing DBS they risked alienating the affiliates on which they were symbiotically dependent. On the other hand, the affiliates could not on their own produce the quantity of high-production-value programming that the networks provided. While it remains speculative until the FCC decides what action to take, the unintended consequence of pursuing HDTV may be that cable systems will offer 500 channels of television programming, further diluting the power and influence once exercised by the networks.

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[74] Mark Robichaux, Need More TV? TCI May Offer 500 Channels, Wall St. J., Dec. 3, 1992, at B1, B3.

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DECISION-MAKING THROUGH COMPUTER-MEDIATED COMMUNICATION SYSTEMS IN ORGANIZATIONS

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DECISION-MAKING THROUGH COMPUTER-MEDIATED COMMUNICATION SYSTEMS IN ORGANIZATIONS

Computer-mediated communication (CMC) systems[1] provide organizational members with more efficient ways to process information and facilitate human communication. From the perspective of information processing, communication is the exchange of information and inference of meaning among organizational members (O'Reilly & Pondy, 1979). Effective information processing can reduce distortion and increase accuracy in the communication process. Since communication is essential to organizational processes and activities, it is directly related to organizational outcomes (O'Connell, 1988; O'Reilly, Chatman & Anderson, 1987). This information processing perspective provides a basis for examining impacts of CMC systems in organizations. CMC systems aid in processing information in many ways. They can provide organizational members with access to information not otherwise available, or not available quickly enough before a decision is made. They also facilitate rapid dissemination of information, through which ideas can be exchanged in a more timely, accurate fashion.

While interactivity is probably the most salient characteristic of computer-mediated communication, organizational members should be able to process information more effectively by using CMC systems in a more interactive way. This paper argues that interactive use of CMC systems has the potential to improve the quality of decision-making. Interactive use concerns more control over the communication process and more access to other people. The decision-making process is evaluated in terms of access to quality information, participation, consensus, speed, effectiveness, and acceptance. This study examines the use of a CMC system, including amount of use, purposes of use and degree of interactive use, in an organizational setting and its impacts on the general decision-making process.

REVIEW OF LITERATURE AND RATIONALE

Interactivity

Computer-mediated communication is defined as interactive communication facilitated with the help of computers (Culnan & Markus, 1987; Rice & Rogers, 1984). Interactivity is the most salient characteristic of CMC systems, which allow increased interactivity among users or between users and information. Interactivity, thus, is a variable characteristic of the communication process. Rafaeli (1986b, 1988) defined interactivity in terms of the responsiveness or conversationality of participants in communication systems, the degree to which a communication exchange resembles human discourse. He defined interactivity as "an expression of the extent that in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions" (Rafaeli, 1988). Fully interactive communication processes are ones that are closest in form to human discourse; however, ultimate interactivity is only an ideal. Rafaeli (1986b) argued that the computer is likely to add interactivity to communication settings. The computer can increase interactivity by involving more participants in the communication process, by increasing audiences to certain messages, and by offering diverse sources.

Williams, Rice, and Rogers (1988) provided a clearer definition of interactivity, "the degree to which participants in a communication process have control over, and can exchange roles in, their mutual discourse" (p. 10). Control indicates the extent to which a participant can choose the timing, content, and sequence of a communication act, while exchange of roles refers to the ability of person A to take the position of person B and thus to perform B's communication acts, and vice versa. Mutual discourse is the degree to which a given communication act is based upon a prior series of communication acts. This definition of interactivity is consistent with the concept of responsiveness proposed by Rafaeli (1988).

Heeter (1986) clearly stated that interactivity is a multidimensional concept. She integrated the work of Rice (1984b), Paisley (1983), and Rafaeli (1986b) and developed six dimensions of interactivity: 1) the complexity of choice available (Rice, 1984b), the extent to which users are provided with a choice of available information; 2) the effort users must exert to access information (Paisley, 1983); 3) responsiveness of a medium to the user, as defined by Rafaeli (1986b); 4) the potential of a medium to monitor system use; 5) ease of adding information, the degree to which users can add information to the system that a mass audience can access; and 6) the extent to which a medium facilitates interpersonal communication between specific users. One advantage of Heeter's concept of interactivity is that it is intended to be applied to a wide range of media. When a new kind of communication technology becomes available, researchers can easily assess its degree of interactivity. However, her concept focused more on the media characteristics and conditions under which interactive media are used than on the communication process brought about by interactive media. Further, no empirical evidence supported the variations of those dimensions across media.

Interactivity is a desired quality of communication systems under the assumption that increased interactivity leads to more effective communication and more satisfaction to participants in communication processes (Rogers, 1986). Previous studies (e.g., Heeter, 1986; Miller & Vallee, 1980; Rafaeli, 1986b, 1988; Rice, 1987; Williams et al., 1988) clearly suggest that interactivity should be conceptualized in terms of the amount of control participants have over the communication process and the degree of access participants have to other participants (Miller & Vallee, 1980). Participant control includes how quickly feedback can be received, how responsive a communication process is, and how easily a participant can enter inputs (Johansen, Vallee, & Spangler, 1979; Kerr & Hiltz, 1982; Kiesler, Siegel, & McGuire, 1982). Access refers to the extent to which individuals can be linked together by a medium, so they can be sources as well as receivers of information during a communication process. The above discussion leads to the formulation of the following dimensions for interactivity:

Immediacy of feedback, the extent to which feedback can be received quickly.

Responsiveness, the extent to which any third or later message in a given series of communication exchanges is associated with the way previous exchanges are related to even earlier ones.

Source diversity, the extent to which information can come from more than one source.

Communication linkages, the extent to which individuals can be linked together by a medium during the communication process.

Equality of participation, the extent to which participants can express their opinions at any time during the communication process.

As demonstrated in Table 1, all four types of CMC systems allow diverse sources of information, a number of communication linkages and more equal participation. Feedback can be received quickly through all types of CMC systems except bulletin boards for their public nature. For the same reason, bulletin boards are low in responsiveness, as compared with other types of CMC systems. But the actual degree of responsiveness is largely determined by how interactive participants are in the communication process.

Increased interactivity among users can be brought about by CMC systems. The actual degree of interactivity is determined not only by the kind of system people use, but how people use it. In other words, people should be willing to use a CMC system interactively. It is argued that interactivity is a desired quality of communication patterns that vary among individuals. Interactivity is, then, conceptualized from the user's perspective. This conceptualization of interactive use embraces earlier concepts of interactivity. It implies that users recognize the interactive capacity of a particular communication system. It also implies that participants in a communication process would be willing to communicate interactively.

Amount of Use

Amount of use can be conceptualized as the number of messages an individual sends or the time an individual spends online. E-mail users reported sending an average of two messages per day or nine messages per work week to other people (Sproull & Kiesler, 1986; Steinfield, Jin, & Ku, 1988) and spending as much as 39 minutes per day using e-mail systems (Nyce and Groppa, 1983; Rice & Case, 1983; Rice & Shook, 1988). Voice mail is used less often (Rice and Shook, 1990). In a study of electronic bulletin board use in a university (Rafaeli, 1986a), nearly three-fourths reported using the board more than once a week and 61% reading more than half of the messages on the board. Sixty-two percent of the users spent 5 to 15 minutes each time on the board. Use of computer conferencing systems is more complex. Patterns of use can include: number of items composed, received, and exchanged privately and within a group and length of each session or total time spent over a period of time (Hiltz & Turoff, 1981).

Research findings show an increased number of communication partners and new intraorganizational communication networks after the implementation of electronic messaging and conferencing systems (Palme, 1981; Rice, 1984a; Rice & Case, 1983). It is reasonable to expect a positive relationship between amount of use and interactive use.

Purposes of Use

Steinfield(1985, 1986b) identified task-related use (e.g., coordinating project activities and scheduling meetings) and socioemotional use (e.g., taking a break from work and keeping in touch) of electronic mail. In a subsequent study, Steinfield and colleagues (1988) suggested four dimensions of electronic mail use: routine use such as information exchange, complex use such as negotiating and bargaining, social use such as keeping in touch, and bulletin board use such as broadcasting information requests. Implied within those four purposes of use is that organizational members choose a CMC system to communicate a particular message both for its ability to transmit data and for its ability to carry the symbolic meaning meant by the sender.

In a cross-organizational study of research scientists who used a computer conferencing system, Hiltz (1984) found that system use leads to increased communication with colleagues both on and off the network. System members appear to "become indirect links between the online and off-line worlds" (Hiltz, 1984, p. 153). It can be inferred from the findings that both task and non-task related uses of electronic mail systems contribute to more interactive use.

Quality of Decision-Making

O'Reilly, Chatman and Anderson (1987) argued that the quantity and quality of information decision makers use will affect the quality of decisions. Bias towards information seeking has been well-documented. Instead of seeking out the most accurate information, decision makers rely on more accessible sources (O'Reilly, 1982). They also have a tendency to search for more information than can be effectively processed (Feldman & March, 1981), but seek out information that supports a desired position and avoid unsupported information (Janis & Mann, 1977). When presented with a large quantity of information, decision makers appear to interpret and evaluate the information differently (e.g., Hawkins, Hoffman, & Osborne, 1978; Kilmann & Mitroff, 1976). These findings suggest that decision quality is directly related to the quality of information necessary to support decision-making.

In addition to information quality, the quality of decisions can be affected by a variety of factors. Organizational decisions are the outcome of a dynamic process to achieve a desired goal. Decision makers have to process, interpret and evaluate a great deal of information. The development, evaluation and selection of alternatives would benefit from exchange of information among a moderate to large number of experts (Huber, 1990). Thus, the number of people participating in the decision-making process as a source of information may influence decision quality.

To facilitate the decision-making process, participants can achieve a consensus about how alternatives should be developed and evaluated and which alternatives should be selected. When people have agreed upon how a problem should be solved, they may be more willing to accept the results (Ivancevich & Matteson, 1990). Consensus can be reached at individual or group level.

Decision-making also involves the time it takes to make a decision. Generally, there are two types of decisions: programmed and nonprogrammed (Ivancevich & Matteson, 1990). Programmed decisions deal with problems that are repetitive and routine. These decisions can be handled through standardized procedures. In contrast, nonprogrammed decisions require judgment, tolerance for ambiguity and creative problem solving. Making nonprogrammed decisions is expected to require more time than making programmed decisions.

Decisions have to be evaluated in terms of their effectiveness, which can be determined by comparing the actual results with the objective or perceived goal of decision-making (Ivancevich & Matteson, 1990). It seems that effectiveness of programmed decisions can easily be evaluated, while the evaluation of nonprogrammed decisions is more complex and long-term results should be taken into account. Sometimes the outcome of a decision is unexpected or perceived differently by different people, and decision makers would have to determine if such outcome is still effective.

Acceptance of final decisions among organizational members will facilitate the implementation of the decisions. Decision acceptance remains an understudied area, since most studies on decision-making focus on how managers make decisions. Once a final decision is made, acceptance is assumed. This study argues that acceptance should not be an assumption, but a factor to be examined.

Based on the above discussion, the quality of decision-making should be conceptualized to include the following concepts:

Information quality, the extent to which information necessary to evaluate decision alternatives is available, timely, accurate, comprehensive, and relevant.

Participation, the number of people participating as information sources in the decision-making process.

Decision consensus, the extent to which decision makers can reach an agreement .

Decision speed, the time it takes to make a programmed or nonprogrammed decision.

Decision effectiveness, the extent to which a decision meets the perceived goals of communication to solve a problem.

Decision acceptance, the extent to which a final decision can be accepted by individuals.

Use of CMC systems can aid not only in identifying problems and opportunities, but in more access to information that is more accurate and comprehensive (Huber, 1990). Bailey and Pearson (1983) used the quality of information as part of a technique for measuring computer user satisfaction. It is reasonable to expect that interactive use will increase access to quality information.

In many organizational decisions, the development, evaluation, and selection of alternatives would benefit from sharing information among a variety of participants. Assuming that the number of people involved in a decision-making process is largely determined by the time and effort it takes for people to communicate, Huber (1990) posits that more people would serve as sources of information because computers can greatly reduce the effort required for people separated in time and physical proximity to exchange information. Interactive use is expected to increase participation in the decision-making process.

Research findings generally suggest that it is less likely to reach consensus in computer conferencing than in face-to-face meetings (Kerr & Hiltz, 1982). This, Rice (1984a) reasoned, might be partially due to time limits and technical factors. He expected the problem to improve when participants have gained more experience. In a review of 10 experimental group decision support system (GDSS)[2] studies by Dennis, George, Jessup, Nunamaker and Vogel (1988), three studies found that GDSS supported groups were less likely to achieve consensus; however, the results have been inconsistent for other studies. Considering using electronic mail to make decisions, it may become more difficult to achieve consensus due to more people entering comments at any time and less pressure on people to agree with others unless a leader emerges or initial consensus is reached (Rice, 1984a).

Findings about the time required to make a decision have been inconsistent for different types of electronic meeting systems. While several studies found that it took more time to make decisions for computer conferencing and GDSS groups than for face-to-face groups (Dennis et al., 1988; Rice, 1984a), others found no such differences (Dennis et al., 1988; Steinfield & Dick, 1989). On the other hand, managers reported that electronic mail saved them several hours a week, mostly by eliminating unreturned phone calls and internal correspondence (Nyce & Groppa, 1983), and helped them make decisions more quickly (Crowford, 1982). It seems that CMC systems can help people make programmed decisions more quickly in that an established procedure has been developed for people to follow. It will take more time to reach nonprogrammed decisions. Since there are no predetermined procedures for handling them, more inputs will be required from organizational members to develop alternatives, and people will have to spend more time evaluating and selecting alternatives.

Regarding decision quality, studies have found that computer conferencing is at least as effective as face-to-face meetings (Ku, 1990; Dennis et al., 1988; Steinfield & Dick, 1989), and more effective in other experimental conferencing settings (Dennis et al., 1988). In case and field studies of GDSS groups, participants unanimously reported greater effectiveness than groups without the aid of computers (Dennis et al., 1988). Those who uses CMC systems interactively are expected to make more effective decisions.

Field and case studies of GDSS groups have reported more consistent decision satisfaction than experimental studies. GDSS users in field and case studies reported high satisfaction of the meeting outcome; final decisions were well supported by participants (Dennis et al., 1988). Some participants in GDSS and computer conferencing reported higher satisfaction with meeting outcomes (Dennis et al., 1988), whereas others reported no differences (Ku, 1990; Steinfield & Dick, 1989; Dennis et al., 1988). Interactive use of CMC systems indicates more inputs into the communication process and more exchange of information necessary to make decisions. A positive relationship between interactive use and decision acceptance is anticipated.

METHODS

Field Site

A survey was conducted in the headquarters of a large, geographically dispersed telecommunications company which uses an in-house VAX/E-MAIL system. Because the response rate of a recent company survey was 25%, it was decided that all e-mail users at the headquarters would be included in the study to ensure an adequate number of responses. A self-administered questionnaire was distributed in April, 1992, by mail to 953 e-mail users. A total of 191 completed questionnaires were returned, corresponding to a response rate of 20%.

Sample Characteristics

The respondents consisted of 72% (n=137) males and 28% (n=54) females. They averaged approximately 37 years of age (s.d.=8) and had worked for the company for an average of 6 years (s.d.=4.6). Sixty percent (n=115) of the respondents were non managers, whereas 11% (n=21) were first level supervisor, 22% (n=41) middle managers, and 7% (n=14) upper managers. A range of job types was represented, including engineering (37%), programming (9%), marketing/account management (8%), clerical (6%), finance (5%), systems operations (4%), planning (4%), and a mix of other personnel.

The Survey Instrument

A questionnaire was developed to assess the impacts of electronic mail on general decision-making. Operational definitions of all variables are described below.

Amount of Use. The respondents were asked how many messages were sent and received in a typical work week.

Purposes of Use. There are four purposes of use: routine, complex, socioemotional and bulletin board use. Each was measured by how often they used the system for certain purposes, with never, seldom, sometimes, often and very often as the response categories. For routine use, the respondents were asked how often they used electronic mail to exchange routine information with others, to schedule meetings, and to coordinate project activities. For complex use, they were asked how often they used electronic mail to share opinions, to resolve conflicts/disagreements, and to negotiate. For socioemotional use, they were asked how often they used electronic mail to get to know someone, to keep in touch with someone in another location, and to send notes that contain sociable or non-work related content. For bulletin board use, questions were asked about how often they sent information via electronic mail to a large number of people, read bulletin board style information, and kept track of company news.

Interactive Use. Immediacy of feedback was measured by asking how soon they answered other people's electronic mail, how soon they answered an e-mail message if that message needed some research before it could be answered, and how soon they received other people's feedback to their messages. The response categories included same day, next day, within a week, within two weeks and don't always answer messages or receive feedback. To measure responsiveness, questions were asked about how often they started a topic of discussion in their electronic mail, how often other people responded to the subject they started, and how often they responded to other people's inputs to their earlier e-mail messages. Source diversity was measured by asking how often they received electronic mail containing the same information from different people, from people they didn't personally know, and from people they knew who were not their coworkers. Communication linkages were measured by asking how often they sent electronic mail to people they regularly communicated with face-to-face, people with whom they often communicated over the phone, people they knew who were not their coworkers, and people they didn't personally know. The response categories for the above three dimensions were never, seldom, sometimes, often and very often. To measure equality of participation, the respondents were asked if they felt comfortable sending electronic mail to their supervisor and the company's top executives and using electronic mail to give their opinions to others about a topic under discussion. The response categories for these items included not at all, little, some, much and very much.

Decision quality. Three statements were developed to measure information quality: The quality of information I'm able to get in order to make a decision is timely; the quality of information I'm able to get in order to make a decision is accurate; and the information I can get in order to make a decision is not always relevant. The respondents were asked how much they agreed with the following statements regarding decision participation: I have participated in the decision-making process as a source of information; I'm consulted by other people before a decision is made; and I give advice about how a decision should be made. Decision consensus were measured by asking how much the respondents agreed with the following statements: I tend to agree with others about how a decision should be made; I have difficulties in agreeing with others about how a decision should be made; and I feel pressured into agreeing with others while a decision is being made. For programmed decision time, three items were used: I spend a lot of time making a decision that has an established procedure to follow; I spend little time making a decision that has standard procedures to follow; and I often can make a routine decision quickly. Another three items were developed for nonprogrammed decision time. They were: It takes a lot of time to make a decision that has no standard procedures to follow; it takes little time to make decisions that require innovative solutions; and I spend a lot of time making a decision that requires creative thinking. Decision effectiveness was measured by asking the respondents the extent to which they agreed with the following statements: I'm satisfied with the quality of my decision; I make effective decisions; and the quality of my department's decisions is not satisfactory. Decision acceptance was measured by asking the respondents to indicate how much they agreed with the following statements: I usually accept the result once a decision is made; It's hard to accept decisions that have been made; and I tend to accept a decision when I've been involved in the decision-making process. The five response categories for the above statements were from "strongly disagree" to "strongly agree."

Finally, it is necessary to acquire specific information about how electronic mail has helped improve the quality of their decision. The respondents were asked to give an example. Answers to this open-ended question were not analyzed on the computer, but will be discussed in the discussion section.

Data Analysis

Data were keypunched and stored on diskette and processed through a Macintosh version of SPSSX. Steps, as indicated by Tabachnick and Fidell (1983), were taken to screen the data prior to statistical analysis. Data were inspected for incorrect entry and missing data and outliers were evaluated and treated.

A series of confirmatory factor analyses (CFA) was conducted to assess the validity and reliability of the underlying measures of e-mail uses and quality of decision-making. Confirmatory factor analyses allow the researcher to specify expected dimensions and determine how well the given items fit the theoretical measurement model (Hunter & Gerbing, 1982). A downsized version (Hamilton & Hunter, 1988) of the PACKAGE program (Hunter & Cohen, 1969) was used to conducted the tests. The measures were first tested for internal consistency--whether items composing the underlying factor are related to one another in a consistent fashion (Hunter & Gerbing, 1982). No internal consistency tests can be done for factors that contain fewer than three items. The measures were then tested for parallelism, or external consistency--whether items representing the same factor have similar patterns of correlations with items on other factors or other traits (Hunter & Gerbing, 1982). Factors were then defined as construct estimates, taking error of measurement into account. The CFA computes the reliability (lack of error of measurement) of each construct estimate using standard score coefficient alpha. Hunter and Gerbing (1982) stated that the criteria of internal and external consistency should be satisfied before the value of coefficient alpha can be interpreted. If one item fails the internal consistency and parallelism tests, it should be dropped from the factor. Then, the CFA procedures have to be repeated. Dropping the offending item usually, though not always, leads to improvements on internal consistency, parallelism and reliability. The CFA also produces factor loadings. Items measuring the same factor should load high on that factor and load low on other factors. Offending items should be dropped from the analysis and the CFA be repeated to make the results cleaner and easier to interpret.

Pearson correlation tests and multiple regression tests were conducted by using SPSSX. The correlation coefficient for each pair of variables was tested for statistical significance at .05 level. Variables were checked for possible violations of various assumptions about regression analysis prior to regression tests predicting quality of decision-making. For each regression equation, variables regarding amount of use, purposes of use, and interactive use were entered by using stepwise selection.

RESULTS

Confirmatory Factor Analyses

Purposes of Use. Four purposes were confirmed after dropping the offending items. Table 2 presents the final factor loadings. Routine use included exchanging routine information, coordinating project activities, scheduling meetings and sending information to a large number of people, while complex use included resolving conflicts, disagreements and negotiating. Socioemotional use consisted of sending sociable or nonwork-related notes and getting to know someone, whereas keeping track of company news and reading bulletin board style information were bulletin board uses.

Interactive Use. Three CFAs were conducted for the five dimensions of interactive e-mail use because different response categories were applied. Immediacy of feedback was left with two items involving how quickly people answered e-mail messages and messages that need some research (see Table 3). Responsiveness included: I start topics of discussion in my electronic mail; people respond to the subjects I start; and I respond to other people's inputs to my earlier e-mail message (see Table 4). The initial CFA results suggested that the items measuring source diversity and communication linkages were intercorrelated. It did not matter whether the user was the source or the receiver of a piece of information. What mattered was that the user was connected to others in the network. Thus, after one offending item was dropped, the remaining six items were combined to measure only one construct. A second test of CFA indicated a new factor--Communication diversity, which included: I receive e-mail messages from people I don't know and from noncoworkers; I send e-mail messages to people I regularly communicate face-to-face and over the phone; and I send e-mail messages to noncoworkers and people I don't know. Equality of participation was left with two items regarding how comfortable people felt when sending electronic mail to their supervisor and to express their opinions about a topic under discussion (see Table 5).

Quality of Decision-Making. Twenty-one items were used to measure seven dimensions of decision quality. All dimensions but decision consensus were confirmed. Information quality included timely and accurate information, whereas decision participation included three items: I participate in the decision-making process as a source of information; I'm consulted by others before a decision is made; and I give advice about how a decision should be made. Programmed decision time concerned speed for making decisions that have established and standard procedures to follow, while nonprogrammed decision time dealt with speed for making decisions that have no standard procedures to follow, require creative thinking and innovative solutions, and are routine. Decision effectiveness involved how satisfied people are with the quality of their decisions, and how effective they perceived their decisions to be. Finally, decision acceptance included two items: I accept the result once a decision is made and I tend to accept a decision when I've been involved in the decision-making process. The final results are presented in Table 6.

The scales of all resulting factors were created by averaging across the clustered items. Table 7 shows the means and standard deviations of all variables. Reliability coefficients (alphas) are available only for scales resulting from CFAs.

The respondents reported to send an average of 21 messages per work week (s.d.=22.4), a fairly large amount of use when compared with other studies in organizational settings. During the pre-survey interviews, several enthusiastic users said they spent 1 to 1.5 hours per day answering e-mail messages, which is probably a close description of the average user. Routine use appeared to be the most common purpose of using electronic mail (mean=3.82, s.d.=.75), followed by bulletin board use (mean=3.11, s.d.=1.07). Electronic mail was not often used to perform complex tasks (mean=2.42, s.d.=.82), or send socioemotional content (mean=2.12, s.d.=.69).

They claimed that they answered other people's e-mail messages quickly (mean=4.31, s.d.=.6) and communicated with a variety of people (mean=3.19, s.d.=.59), including coworkers, noncoworkers, people they personally knew, and people they didn't know. They felt they could participate in the communication process equally by using electronic mail (mean=3.98, s.d.=.85). The degree of responsiveness fell between "sometimes" and "often" (mean=3.25, s.d.=.83).

Regarding the six dimensions of quality of decision-making, the respondents believed the information they could get to make a decision was somewhat timely and accurate (mean=3.45, s.d.=.64), and they made effective decisions (mean=3.96, s.d.=.47). They often participated in the decision-making process (mean=3.59, s.d.=64) and were inclined to accept the results of the decision-making process (mean=3.89, s.d.=.49). Although they reported spending more time making nonprogrammed decisions (mean=2.61, s.d.=.53) than programmed decisions (mean=2.25, s.d.=.63), they often made a decision quickly.

Bivariate Correlation Tests

The results showed that frequent users tended to use electronic mail more interactively, and interactive use appeared to be task-oriented (see Table 8). Specifically, the number of messages sent, routine use, and complex use were positively related to responsiveness, communication diversity and equality of participation (r's = .20 - .48). Their relationships with immediacy of feedback were positive but insignificant. Nontask-related uses showed no relationships with interactive use except for the significant relationship (.18) between socioemotional use and responsiveness.

Regarding the six dimensions of quality of decision-making, information quality, decision participation, and decision effectiveness were positively related to one another as expected (r's = .26 - .30). The respondents were more likely to accept the decisions when they participated in the decision-making process (r = .15) and felt they had made effective decisions (r = .27). Participation and quality information helped reduce the time it took to make decisions (r's = -.15 - -.21), regardless of types of decisions (programmed or nonprogrammed). Decision effectiveness was negatively correlated with decision speed (r's = -.23 - -.35), suggesting that the respondents equated effectiveness with efficiency. The results are in Table 9.

Table 10 presents the relationships between uses of electronic mail and quality of decision-making. Frequent users felt they participated in the decision-making process more often (r = .25) than infrequent users. Task-related uses were positively related to information quality and decision participation (r's = .15 - .22), but not related to other dimensions of quality of decision-making. The respondents seemed to consider using electronic mail for social purposes as interfering with their work. Socioemotional use were positively related to decision time (r's = .12 - .15) and negatively related to decision effectiveness (-.27). Bulletin board use presented no relationships with any aspect of decision-making. In general, interactive use of electronic mail facilitated access to quality information, increased participation and slightly improved decision effectiveness. All dimensions but immediacy of feedback showed moderate relationships with decision information and participation (r's = .13 - .34). None of the dimensions but equality of participation had positive effects on decision effectiveness and acceptance (r's = .14 - .16). Finally, immediacy of feedback had no effects on any of the six dimensions of decision quality.

Multiple Regression Tests

Regression analyses were conducted for each of the six dimensions of general quality of decision-making. In general, uses of electronic mail were not strong predictors; however, the results, as reported in Table 11, indicated that certain aspects of electronic mail could help users make better decisions by offering easier access to quality information and more frequent decision participation. On the other hand, socioemotional use of electronic mail showed negative effects on decision-making. Equality of participation was the only predictor of access to quality information (Beta = .18, multiple R =. 18, F = 6.59, *p.* <.01). Equality of participation was also the strongest predictor (Beta = .32) of decision participation (multiple R = .41, F = 12.65, *p.* <.001). Complex use increased participation (Beta = .17) while socioemotional use did just the opposite (Beta = -.18) . Socioemotional use prolonged the time it took to make programmed decisions (Beta = .15, multiple R = .15, F = 4.34, *p.* <.05). Equality of participation contributed to effective decision-making (Beta = .19), while socioemotional use interfered in the process (Beta = -.29, multiple R = .33, F = 11.71, *p.* <.001). Decision acceptance was predicted by routine use (Beta = .20) and socioemotional use (Beta = -.16, multiple R = .23, F = 5.19, *p.* <.01). None of the dimensions of interactive use had any effects on decision acceptance. Finally, the time it took for making nonprogrammed decisions could not be explained by uses of electronic mail.

SUMMARY AND DISCUSSION

The purpose of this study is to examine the effects of uses of CMC systems on the general quality of decision-making. It is argued that interactive use of CMC systems has the potential to improve the decision-making process in general, and the empirical evidence reported here provided some support for this argument. Although this study focuses on one type of CMC system, namely, electronic mail, the findings are expected to provide some insights into how other types of CMC systems might influence decision-making.

Frequent users often used electronic mail to perform tasks, answered messages quickly, were more responsive in the communication process, established linkages with others that might not otherwise be available, and enjoyed more equal participation. They had incorporated electronic mail into their job and seemed to recognize the interactive nature of electronic mail and were simply taking advantage of it. Electronic mail was seldom used for socioemotional purposes, inconsistent with previous findings. Those who used electronic mail more often for socioemotional purposes were less likely to participate in decision-making and less likely to make effective decisions. It is speculated that frequent socioemotional users might have less influence on decision-making, or were outcasts in the organization. But when people did use it to communicate socioemotional messages, they appeared to be responsive.

The quality of decision-making emerged as a multidimensional concept. More access to quality information and greater participation reduced time in making decisions and increased effectiveness of decisions. People were more likely to accept the final decisions when they were involved in the decision-making process and when they believed their decisions were effective. The respondents usually made decisions quickly and seemed to equate efficiency with effectiveness.

The findings clearly indicated equal participation as the most important characteristic of interactive use. Since electronic mail allows inputs to be entered more freely, it can facilitate human communication in many ways. For example, electronic mail can be a more efficient and effective way in soliciting ideas and opinions. Although the regression results suggested that the quality of decision-making was largely determined by factors that were not examined in the current study, they generally confirmed the expectation that interactive use of electronic mail facilitates information exchange and participatory decision-making. It is also a positive sign that interactive use would not increase the time it takes to make decisions.

Among the 191 respondents, 83 (43%) offered more in-depth information about how electronic mail has helped improve decision quality. Ninety percent of those who answered the open-ended question claimed that use of electronic mail did help them make better decisions in many ways. The most important function of electronic mail, they believed, was that inputs could be solicited from a large number of people, especially those geographically dispersed, in a timely fashion. A large number of inputs often provides more precise evaluations of the issues at hand, which helps people make a decision more rapidly. One respondent said sometimes other people already had solutions to certain problems and the information was not available unless it was solicited. It reduced research time and, of course, decision time. Many reported that electronic mail also facilitated exchange of information. This is important for decision-making because everyone is kept informed of other people's positions on the issue at hand. Several commented that sufficient information had to be exchanged so that a consensus decision, rather than an authoritative one, could be reached.

Increasing access to information emerged as another function of electronic mail. Information was either requested from other communication partners or retrieved from files. Several believed information retrieval to be very important in making decisions. They often needed information about solutions to previous problems, meetings and other people's positions on certain issues. Several respondents pointed out that electronic mail made information management easier, while others relied more on e-mail's capacity of prompt distribution of information than others. Through electronic mail it was easier to inform other people of new pieces of information pertaining the same problem, new solutions to a problem, the final decision and plans of carrying out the decision. At the same time, people would like to be informed. They did not want to be left out.

Several respondents acknowledged the asynchronous characteristic of the CMC process. Using electronic mail avoids the problem of "telephone tags." Both the sender and receiver of information can enter inputs at their convenience. One observed that in the company many people were slow in returning phone calls, but most people were fast in terms of returning e-mail messages. This observation reveals something about organizational culture. It should not be too surprising to find that employees of a telecommunications company answered e-mail messages promptly when using electronic mail was part of the job description for many of them.

Keeping accurate and permanent accounts of communication is a technical capacity of electronic mail and CMC systems in general. Many respondents considered it crucial. To them sending e-mail messages was a way of documenting conversations, facts or opinions to reduce misunderstanding or clarify positions. It is easier for decision makers to keep track of all information pertaining to a problem. Many considered documentation of conversations as a way of protecting themselves if questions about certain decisions were raised in the future.

Several respondents reported more control over the communication process in that they could choose the right time and right words to communicate with others. Electronic mail, as compared to telephone conversations, had the potential to reduce misunderstanding because an e-mail message was more likely to be thought through so people are less likely to respond with emotions. The user has the "ability to pick and choose words to be completely clear," whereas the receiver "would be careful and accurate in his/her response." Rapid and precise communication via electronic mail is likely to improve communication and the flow of information. The respondents were able to compare the characteristics of various media and chose the one that they believed would convey both the content and the symbolic meaning of a message.

However, for the same reasons, others insisted that electronic mail decrease the quality of decisions because of lack of physical proximity and interpersonal interaction. They considered electronic mail as impersonal, appropriate only for decisions of low importance. One complained that electronic mail "takes away interpersonal interactions among people." Another claimed that "most people can't express themselves properly by using the written word." In this case, the users were still able to identify the characteristics of electronic mail, but weighted those characteristics totally different from those who decided to use the medium.

The above findings have important ramifications for the study of organizational use of CMC systems in general and electronic mail in particular. An expansion of the concept of interactivity, interactive use of electronic mail is a new concept for researchers to explore. Characterized by the control over communication process and access to communication partners, interactive use can provide more accurate assessments of organizational media behavior. In other words, the concept of interactive use attempts to tap "how" people use interactive media, as compared to previous focuses on "what" was used and "why" it was used.

Electronic mail can be used to perform tasks and make decisions when face-to-face (or other modes of communication) is unavailable or undesired. Positive outcomes can be anticipated when users start taking control over the way they communicate with others. In this study, interactive use appeared to contribute to the decision-making process. Various aspects of the decision-making process were examined, indicating that the quality of decision-making can be evaluated in a broader scope. Based upon the results, organizations can develop strategies to encourage interactive use for problem-solving.

With a 20% response rate, any inferences from the findings about the company as a whole should be cautious. The concern is the difference, if any, between those who answered the questionnaire and those who did not. It was speculated that the respondents might be more enthusiastic e-mail users than the nonrespondents, though the profile of the respondents did not exhibit any extremely or unreasonably skewed distributions. The relatively small sample (n=191) has posed problems for some measures. The CFA program is sensitive to the size of sample and the number of items measuring the same construct. Some measures were left with only two items, making tests of internal consistency impossible. Regarding the questionnaire, the respondents were obviously confused by questions with reverse wording, which was manifested by the CFA results.

Nevertheless, the concept of interactive use presents a promising research direction. It can be applied to other types of interactive media such as computer conferencing. Will interactive users of electronic mail use other media also in an interactive way? Interactive use also can be examined in terms of changes in communication structure and social networks. Another way is to examine what determines interactive use of CMC systems. Personal characteristics and communication behaviors are expected to associate with interactive use. The impacts of interactive use on decision-making can be further explored. For example, objective measures can be developed for both concepts. The process of making one particular decision through CMC systems can be studied. The current study has established preliminary support for interactive use of CMC systems and its contribution to organizational performance; further research will add to our understanding of organizational communication.

NOTES

[1] The CMC systems included in the discussion are electronic mail, voice mail, computer conferencing and electronic bulletin boards. Online information retrieval systems and videotex systems are excluded.

[2] A GDSS provides computing, communication and decision aids to support group decision making. A basic GDSS has e-mail capabilities, designed primarily to improve the rate of information flows in the decision process. The second-level GDSS supplement the basic technology with a variety of decision support tools such as decision trees and budget allocation models. The third level GDSS imposes structure on communication patterns. They control the timing and pattern of information exchange. They can also restrict communication linkages among group members. For detailed descriptions of GDSSs, see DeSanctis and Gallupe (1987). In a study by Straub and Beauclair (1988), 19% of the firms surveyed used computer conferencing for decision making and 10% had implemented decision rooms.

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Comparisons of dimensions of interactivity for CMC systems
Table 1

CMC System

Interactivity	Electronic Mail	Voice Mail	Computer Conferences	Bulletin Boards
Immediacy of feedback	fast	fast	fast	slow
Responsiveness	*	*	*	low
Source diversity	many	many	many	many
Communication linkages	many	many	many	many
Equality of participation	high	high	high	high

*: Level of responsiveness depends largely on situations and how the systems are used.

Confirmatory Factor Analysis of Purposes of Use of Electronic Mail
Table 2

Confirmed Individual Purposes	F 1: Routine Use	F 2: Complex Use	F 3: Socio-emotional Use	F 4: Bulletin Board Use
Exchange routine information	**.42**	.19	.22	.20
Coordinate project activities	**.69**	.29	.32	.14
Schedule meetings	**.70**	.22	.04	.01
Send information to a large number of people	**.62**	.17	.14	.02
Resolve conflicts/ disagreements	.29	**.78**	.17	.18
Negotiate	.27	**.78**	.24	.28
Send sociable or non-work related notes	.14	.12	**.59**	.17
Get to know someone	.21	.19	**.59**	.22
Keep track of company news	.15	.23	.26	**.75**
Read bulletin board style information	.08	.21	.23	**.75**
Percent of variance explained	17.77	15.62	10.75	13.72

Confirmatory Factor Analysis of Immediacy of Feedback for
Interactive Use of Electronic Mail
Table 3

Confirmed Items	F 1: Immediacy of Feedback
Immediacy of answering other people's e-mail	**.59**
Immediacy of answering other people's e-mail that needs some research	**.59**
Percent of variance explained	34.81

Confirmatory Factor Analysis of Interactive Use of Electronic Mail
Table 4

Confirmed Items	F 1: Responsiveness	F 2: Communication Diversity
I start topics of discussion in my e-mail	**.82**	.44
People respond to the subjects I start	**.91**	.40
I respond to other people's inputs to my earlier e-mail message	**.60**	.35
I receive e-mail from people I don't know	.27	**.40**
I receive e-mail from non-coworkers	.22	**.53**
I send e-mail to people I regularly talk with face-to-face	.28	**.39**
I send e-mail to people with whom I often speak on the phone	.37	**.59**
I send e-mail to non-coworkers	.18	**.56**
I send e-mail to people I don't know	.24	**.61**
Percent of variance explained	25.41	23.37

Confirmatory Factor Analysis of Equality of Participation for Interactive Use of Electronic Mail
Table 5

Confirmed Items	F 1: Equality of Participation
Feeling comfortable sending e-mail to my supervisor	**.70**
Feeling comfortable using e-mail to give opinions about a topic under discussion	**.70**
Percent of variance explained	49.00

Confirmatory Factor Analysis of Quality of Decision-Making
Table 6

Confirmed Items		F 1: Information Quality	F 2: Decision Participation	F 3: Programmed Decision Time	F 4: Nonprogrammed Decision Time	F 5: Decision Effectiveness	F 6: Decision Acceptance
F 1:	Information is timely	**.69**	.31	-.18	-.27	.23	.00
	Information is accurate	**.69**	.28	.00	-.16	.30	.08
F 2:	I am a source of information	.30	**.62**	-.11	-.31	.27	.11
	I'm consulted by others	.38	**.70**	-.08	-.17	.37	.18
	I give advice	.14	**.60**	-.25	-.28	.21	.28
F 3:	Decisions having established procedures to follow	-.04	-.11	**.69**	.23	-.20	-.19
	Decisions having standard procedures to follow	-.14	-.20	**.69**	.20	-.26	-.30
F 4:	Decisions having no standard procedures to follow	-.32	-.26	.13	**.56**	-.28	.01
	Decisions requiring creative thinking	.03	.06	.04	**.40**	-.17	-.06
	Decisions requiring innovative solutions	-.06	-.22	.09	**.59**	-.28	.04
	Routine decisions	-.28	-.40	.39	**.50**	-.51	-.13
F 5:	I'm satisfied with the quality of my decisions	.38	.26	-.16	-.43	**.72**	.22
	I make effective decisions	.18	.38	-.33	-.44	**.72**	.50
F 6:	I accept the result once a decision is made	.04	.10	-.21	.09	.28	**.53**
	I tend to accept a decision when I've been involved in the decision-making process	.01	.22	-.17	-.16	.25	**.53**
Percent of variance explained		9.94	12.57	9.12	11.67	13.30	7.11

Summary Statistics for All Variables and Scales
Table 7

	Mean	S. D.	Alpha
Amount of Use:			
- # of messages sent	21.08(wk)	22.40	n/a
Purposes of Use:			
- routine use	3.82a	.75	.69
- complex use	2.42a	.92	.70
- socioemotional use	2.12a	.74	.52
- bulletin board use	3.11a	1.08	.72
Interactive Use:			
- immediacy of feedback	4.31b	.60	.52
- responsiveness	3.25a	.83	.82
- communication diversity	3.19a	.59	.68
- equality of participation	3.98c	.85	.66
Decision quality:			
- information quality	3.45c	.64	.64
- decision participation	3.59c	.64	.67
- programmed decision time	2.25d	.63	.64
- nonprogrammed decision time	2.61d	.53	.58
- decision effectiveness	3.96c	.47	.68
- decision acceptance	3.89c	.49	.44

N=191
a: Scale ranged from 1=never to 5=very often.
b: Scale ranged from 1=don't always answer e-mail/receive feedback to 5=answer/receive the same day.
c: Scale ranged from 1=not at all to 5=very much.
d: Scale ranged from 1=very little to 5=very much.

Correlation Matrix for Amount of Use, Purposes of Use, and Interactive Use of Electronic Mail
Table 8

	1	2	3	4	5	6	7	8	9
# of Messages Sent 1.	-								
Routine Use 2.	**.42**	-							
Complex Use 3.	**.27**	**.26**	-						
Socioemotional Use 4.	.09	**.17**	**.16**	-					
Bulletin Board Use 5.	.07	.09	**.21**	**.20**	-				
Immediacy of Feedback 6.	.13	.08	.07	.11	.08	-			
Responsiveness 7.	**.43**	**.36**	**.34**	**.18**	.11	.11	-		
Communication Diversity 8.	**.36**	**.45**	**.20**	.13	.13	**.16**	**.37**	-	
Equality of Participation 9.	**.31**	**.48**	**.24**	.10	.02	**.19**	**.43**	**.26**	-

N = 191
Note: The highlighted Pearson's correlation coefficients are significant at .05 level.

Correlation Matrix for Dimensions of Quality of Decision-Making
Table 9

	1	2	3	4	5	6
Information Quality 1.	-					
Decision Participation 2.	**.29**	-				
Programmed Decision Time 3.	-.09	**-.15**	-			
Nonprogrammed Decision Time 4.	**-.17**	**-.21**	**.17**	-		
Decision Effectiveness 5.	**.26**	**.30**	**-.23**	**-.35**	-	
Decision Acceptance 6.	.03	**.15**	**-.19**	-.01	**.27**	-

N= 191
Note: The highlighted Pearson's Correlation Coefficients are significant at .05 level.

Relationships Between Uses of Electronic Mail and Quality of Decision-Making

Table 10

	Information Quality	Decision Participation	Programmed Decision Time	Nonprogrammed Decision Time	Decision Effectiveness	Decision Acceptance
# of Messages Sent	.13	**.25**	-.10	-.13	.12	.04
Routine Use	**.15**	**.20**	-.05	-.01	.12	**.17**
Complex Use	-.01	**.22**	.04	-.02	.06	.06
Socioemotional Use	-.06	-.12	**.15**	.12	**-.27**	-.12
Bulletin Board Use	.02	-.09	-.07	.01	-.02	.09
Immediacy of Feedback	.09	.02	.01	-.04	.01	-.04
Responsiveness	.13	**.24**	-.07	-.10	.09	.08
Communication Diversity	**.16**	**.15**	.01	-.03	.06	.08
Equality of Participation	**.18**	**.34**	-.08	-.09	**.16**	.14

N = 191

Note: The highlighted Pearson's Correlation Coefficients are significant at .05 level.

Regression Analysis of Dimensions of Quality of Decision-Making Predicted by Uses of Electronic Mail
Table 11

Independent Variables	Dependent Variables					
	Information Quality	Decision Participation	Programmed Decision Time	Nonprogrammed Decision Time*	Decision Effectiveness	Decision Acceptance
# of Messages Sent						
Routine Use						.20
Complex Use		.17				
Socioemotional Use		-.18	.15		-.29	-.16
Bulletin Board Use						
Immediacy of Feedback						
Responsiveness						
Communication Diversity						
Equality of Participation	.18	.32			.19	
Multiple R	.18	.41	.15		.33	.23
R Square	.03	.17	.02		.11	.05
F =	6.59	12.65	4.34		11.71	5.19
p.	<.01	<.001	<.05		<.001	<.01

Note: The reported Beta weights belong to the variables entered into the equations by stepwise selection.
*: No variables were entered.

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Synchronous and asynchronous forums in cyberspace for theoretical dialectic

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ABSTRACT

Electronic databases, journals and networks are presently being used by scholars to create and disseminate knowledge. This study proposes another potential scholarly use of the electronic medium - on line forums for theoretical dialectic. Written/printed text is by nature more permanent and linear compared to the more ephemeral and interactive oral communication. When written text became the dominant mode of scholarly communication, those traditional oral arenas of thesis-antithesis dialectic too became obsolete. With electronic text, there is an opportunity to regain dimensions of interactivity and revisit the dialectic, that can lead the discipline to higher levels of knowledge synthesis. An overview of asynchronous and synchronous electronic forums indicate an increasing interest among scholars to use these forums for holding discussions on theoretical and research concerns. Comparative advantages of the two types of forums are also discussed.

SYNCHRONOUS AND ASYNCHRONOUS FORUMS IN CYBERSPACE FOR THEORETICAL DIALECTIC

INTRODUCTION

Just as the new communication technologies are emerging as dominant modes of social communication, there is a growing interest among researchers on the technological, social and psychological dimensions of these artifacts. Moreover, scholars are increasingly using these technologies to conduct research, to create and share knowledge - through electronic journals, on-line research collaboration, computer conferences, etc. This exploratory study first of all, makes a case for another scholarly use of these new electronic media - for cyber-discussions over theoretical and conceptual issues that form the foundations of research. Secondly, the study overviews two types of electronic forums - synchronous and asynchronous, that are being used increasingly by communication scholars to discuss and share ideas and exchange information.

The study argues that the interactive nature of electronic media is more conducive to dialogue and debate. Discussions and debates eventually lead to theoretical clarity as the dialectic between thesis and antithesis results in higher levels of knowledge. The study contends that aside from internal forums such as classrooms and colloquia in educational institutions, there is no apparent forum that encourages theoretical debate among practitioners and scholars of a discipline as a whole. Professional journals and conventions do not serve this dialectic function adequately. It is suggested that a good deal of conceptual ambiguity in the field can be attributed to the lack of theoretical debate.

In the second part of the study, two electronic forums that are being increasingly used by communication scholars for theoretical discussions are examined. First, an asynchronous computer conference - CMC Hotline on COMSERVE and second, a real time synchronous conference - Tuesday Cafe at MediaMOO are surveyed. Based on the overview of discussions in these two forums, suggestions are made on how these forums can facilitate an electronic dialectic among communication scholars. Apparent advantages and disadvantages of the forums are also discussed.

REVIEW OF LITERATURE:

Scholars with feathers of every color and hue have begun to build their nests in cyberspace. Jim Potter proposed five levels of computer-based, electronic research environment for social sciences (Potter, 1989) and obviously each of these are already being used by scholars today. For instance, there are a growing number of listservers designed to be scholars' bulletin boards - to serve as forums for speedy exchange of information among scholars who share similar interests. There are electronic journals already available on line (Rhetnet, Electronic Journal for Virtual Culture, etc.) who conduct the whole publication process on line - accepting contributions, reviews and the distribution. Electronic Libraries and on line services (DIALOG, ERIC, ACADEMIC INDEX, etc.) are available that can access current information on any research agenda. Further, research documents presented at several professional conventions are available on line with keyword search facility (e.g. AEJMC Convention 1993, BEA Convention 1994). Increasingly, researchers are using on-line services to work together on common research projects from different locations.

Recent research by Wotring, Forrest and Kayany evaluated the logistics and merits of on-line review of literature, and found that keyword-based searches enable the researcher to compile a comprehensive and up to date list of studies pertinent to the research question (Wotring, et al,1994).

Radway contends that the growing number of on-line research collaborations by scholars in different parts of the globe may change the way scholarship is primarily conceived - as the intellectual output of a lone scholar. It may help us overcome the flaws of the present methodologies as well. Projects that were considered too unwieldy for a single scholar may become feasible with extensive collaboration by a team of scholars (Radway, 1988).

Ann Okerson predicts that electronic journals will replace the paper based scholarly journals because production of electronic journals is cheaper and dissemination more economic and faster. Wider proliferation of scholarship could well be a by-product of this transformation (Okerson, 1991; Shade, 1994).

However, it is noteworthy that the new media are used mostly to facilitate the traditional processes of scholarly communication. E-mail has substituted the 'snail-mail' (an epithet for the postal service that is becoming more popular); card-catalogues in libraries are replaced by keyword searches in electronic libraries. Electronic journals expedite the drawn out process of paper based publication. The new technologies have added speed and convenience but the new media are being primarily used to support the traditional paper based scholarship. However, Okerson's affirmation that electronic journals would force us to rethink the nature of both informal and formal systems of scholarly communication (Okerson, 1991) alludes to a fundamental difference between hardcopy and electronic text. The unique characteristics of the electronic medium, this study argues, needs to be further explored and exploited by scholars.

One of the mental frameworks that academicians may find hard to overcome is their preoccupation with the written word. Perhaps, it is the result of centuries of linear thinking (McLuhan, 1964) as a consequence of our eyes trailing the written word. The intangible processes of knowledge creation are usually regarded inconsequential and only the final outcome - the published product is considered important (Potter, 1989).

Written word is inherently more definitive and canonical whereas oral communication is by nature interactive. Messages were given a more permanent form in hardcopy that facilitated the transportation of ideas across distances over time, but in the process the spontaneity of the interaction was lost. In this age of virtual communities we can span space and time without entirely losing colloquiality and the ephemeral nature of oral communication. We can interact the way our ancestors did sitting around a circle sharing life - though in cyberspace. According to Pool, "A culture that substitutes interactive text for written hard copy may undo what was earlier done when hard copy replaced dialog and in the process produce a new synthesis" (Pool, 1990). Interactive text hence may lead to a synthesis at a higher plane because electronic text as it scrolls down the computer screen preserves to an extent the ephemeral, not-so-definitive nature of oral communication. Perhaps, it is easier to debut new ideas, even half-baked ideas as well as debate, discuss and clarify issues in an electronic forum than through hardcopy text. On the other hand, electronic text shares with written text a quality of permanence as it can be stored, retrieved, reexamined and edited. This property is arguably more conducive to scholarly discussions, because the participants can control the pace of deliberation, and have time to compose and polish their ideas.

As a matter of fact, early civilizations relied on face to face encounters to create and share knowledge, be it Jesus to his disciples or Socrates to his pupils. It was the much hailed interactivity that we had lost with the papyrus - but can regain it to an extent with the new technologies. Along with interactivity, we had also lost one of the very efficient ways of knowledge creation - the dialectic. .

In Hegelian dialectic, one concept, the thesis is followed by its opposite - the antithesis; the ensuing conflict between the two is brought together at a higher level as a new concept, or synthesis, which becomes the thesis of yet another triad. The suitable ambiance for such an ascent towards higher levels of understanding perhaps is that which the Hellenistic Philosophers like Socrates, Plato and Aristotle enjoyed - face to face dialogue, debating philosophical questions with one another. Plato in fact presented his ideas in the form of 26 dramatic dialogues because he considered that the dialogical structure enables more subtle understanding of a complex concept. Perhaps, such a theoretical dialectic could be the sixth level of Potter's taxonomy of scholarly use of the electronic media.

DIALECTIC IN TWO MODES OF SCHOLARLY COMMUNICATION:

Presently, the two dominant modes of scholarly communication are based on hardcopy - professional journals and convention papers. Although unlike professional journals, conventions are intended to be occasions that bring scholars together and provide them forums to exchange and discuss ideas, the pace of professional conventions is such that there is little time for any such dialogue. Take for instance, the SCA Convention in Miami Beach in 1993. According to the Convention Program, during the 36 hours in four days allotted for paper presentations, an average of 22 sessions , each 80 minute long, were being held simultaneously. The total time spent in presentations was 796 hours (equivalent to 33 full days). On the average, 83 papers were being presented every 80 minutes during the allotted 36 hours. Such a hectic pace, as those who attend conventions are aware, is not the best of circumstances for intellectual dialogue.

Similarly, it is easy to recognize the problems with the ways in which knowledge is created and propagated through professional journals. The major problem, of course is the time-lag at every stage of research. Although computers and new communication technologies have made the research enterprise much easier compared to only a decade ago, it is still a long and tedious route. Every scholar has to deal with repeated trips to different libraries to review previous research, lengthy procedures of data collection and analysis, finally the slow pace of the peer review process before it is ready for publication. The 'shelf-value' of the research may have considerably depreciated by the time the research results become public knowledge.

After the research has been published, any discussion, debate, clarification or challenge of theories, methods or findings of the study has to the follow the same winded road. Meanwhile, others may accept the theoretical positions presented in the article and conduct their own studies based on the arguments and assumptions of the original study. As a consequence, the research enterprise carries with it a baggage full of ambiguous concepts.

For instance, consider an example of conceptual ambiguity in the new media research literature. The concept of 'social presence' is widely used in research despite it being "at best a vague concept, never clearly defined by its proponents" (Svenning, & Ruchinskas, 1984). Defined as the degree to which a medium facilitates awareness of the other person and interpersonal relationships and operationalized with the help of a series of semantic differential scales (Short, et al, 1976), social presence and the media appropriateness schemata based on the concept has served as the theoretical basis of several studies (For a list of such studies, see Rice, 1993). Meanwhile, criticisms regarding the original definition and operationalization have been raised (Culnan, & Marcus, 1987; Fulk, Schmitz, & Steinfield, 1990) but remained unanswered, this study argues, for lack of a forum to raise such issues.

ELECTRONIC FORUMS FOR THEORETICAL DEBATE:

A forum where issues can be clarified, theories and counter theories be debated, assumptions challenged, and the dialectic occur, will certainly advance the scholarly enterprise. The existing modes, such as journals and conventions, that are used to distribute knowledge are too constrictive or time consuming to serve as an effective forum for the dialectic. Most importantly, the permanent character of the written word gives journal articles and convention papers a great deal of deliberateness. Repudiation of the assumptions in a journal article would require as much scholarly effort as another research project. The critic also risks alienating a fellow researcher by putting the criticism 'in writing'. On the other hand, if there were an opportunity to meet the author in person or in cyberspace a discussion would be more comfortable for all parties. In fact, a cyber forum may be even better than face to face because it may be easier to deal with the relational dimension of communication when those engaged in discussion are physically apart (Kayany, 1993).

Beyond the theoretical discussions that take place in the classrooms, between faculty members, between the members of the 'invisible colleges', and among those collaborating on research projects, the new communication technologies provide us with an opportunity to develop cyber forums that will bring together scholars from the discipline as a whole. Two such emergent forums are the focus of the second part of this study.

ASYNCHRONOUS ELECTRONIC FORUM

COMSERVE is an electronic information system that is devoted to scholarship pertaining to human communication, established in 1987 and located in Rensselaer Polytechnic Institute, Troy, New York. COMSERVE has a membership of over 20,000 in 38 countries (Shade, 1994). Some of the services provided by COMSERVE are the following: (i) a file server for bibliographies, instructional materials, announcements and research instruments that pertain to human communication. (ii) a service that circulates information about new books, jobs etc. (iii) a directory of communication scholars. (iv) a system for automatic distribution of announcements and research survey forms. (v) finally, hotlines that serve as forums for scholars to interact with each other on diverse facets of human communication. COMSERVE supports 41 such hotlines. The volume of information exchanged in these hotlines are quite impressive - over 35000 contributions have been made by participants during the past 6 years. Members post their questions, responses or comments on these forums which the listserver distributes to the e-mail addresses of all subscribers. Thus each member receives as e-mail a continuous flow of interactions about topics raised by subscribers in the forum. These postings remain in each one's e-mail box until they are deleted or stored away by the member. The member has control over the interaction and can decide if and when he/she wants to respond. Questions are raised, requests made for information, announcements of conferences and computer programs posted, and information voluntarily provided. There is continuous exchange between the subscribers that is potentially instantaneous but the pace of interaction depends totally on the users. This study surveys one of these hotlines that deals with issues pertaining to computer mediated communication - CMC hotline, that has currently 418 subscribers.

SYNCHRONOUS ELECTRONIC FORUM

MOO is a type of MUD where MUD(Multiple User Domain) is a computer program which permits several users to log onto the system, take on a persona or character and control it to move around the system and interact with other such characters. One of the more popular uses of MUDs is for games. MOO (MUD Object Oriented) is a type of MUD which explores a more serious side of the medium. MediaMOO is a MOO based in MIT that is intended as a place for media researchers. It is devoted to research issues pertaining media and provides, among other facilities, a locale for scholars to work together, share information and discuss issues. Netoric Project is one such project in MEDIAMOO that is primarily oriented to those scholars who use computers in teaching writing. Every Tuesday since July 93, scholars from across the globe 'gather' at 8.P.M. Eastern in Tuesday Cafe and hold discussions on a variety of topics. During the past eight months, discussions were held on theoretical concerns such as intergender communication, refining texts in the context of multimedia and computer mediated communication, anonymity in virtual classrooms, etc. Some of the sessions dealt with practical concerns such as the criteria for choosing appropriate software for writing labs, suggestions for developing a K-16 writing curriculum, ways of accessing computer help and hints on using internet resources for writing class, etc. Information regarding the topic is posted on the 'bulletin board' of the Tuesday Cafe in advance. Scholars who are interested in the topic sign on to the system at Tuesday 8. P.M. Eastern and enter a common 'virtual space' called Tuesday Cafe' where the messages they post from their computer terminals are distributed synchronously to the terminals of every member present in the same 'room'. Hence the exchange of messages simulates a group of persons gathered in a room talking to each other. It is also possible to emulate non-verbal responses by a command that describes actions such as 'John blushes at Kerry's remarks", "Greg smiles and waves at Susan", etc. The computer program attempts to create an ambiance similar to a Cafe where friends and colleagues meet informally to discuss matters of common interest and share collegiality and friendship. Discussions last as long the participants want, usually over an hour. Any person can join in or move out from the discussion space at any point.

At the beginning of each session, moderators of the project present the topic of the day and raise relevant questions for discussion. As a participant types in his/her comment, comments and questions from others appear on his/her screen. As Greg types and posts his comment, Susan and John are also simultaneously typing and posting their comments. Greg may respond to John and Kerry may respond to Susan forming two potential threads of discussion. Meanwhile Susan may respond to Greg while Greg may respond to Kerry's response increasing the number of possible threads. Hence, there are simultaneous threads of interaction active and continuously forming. But because the computer doesn't recognize the threads but only the time the member posts his/her message by hitting the 'return' key, the threads are intertwined and may appear to be chaotic jumble to a novice. Besides, as the number of participants increases, the number of threads and the speed of text flow on one's terminal increase. However, following the threads become an art that on learns with practice. The forum simulates a real-time discussion in a conference room where the participants are engaged in informal unmoderated discussion.

This study overviews the above two types of electronic forums that are frequently used by communication scholars in order to assess if there is a theoretical dialectic happening in these forums and if so, the interest demonstrated by the members and participation in such discussions in these forums.

RESEARCH QUESTIONS:

1. To what extent are theoretical discussions taking place in the asynchronous and synchronous electronic forums?
2. What are the apparent differences and similarities between theoretical discussions in the asynchronous and synchronous forums.

STUDY DESIGN AND METHODOLOGY:

Discussions in the asynchronous forum:

This study overviews the types of exchanges that occurred in COMSERVE, an asynchronous forum, during the seven month period from 1 July 93 to 31 January 1994. The logs of messages during this period were retrieved from the archives of COMSERVE.

The postings were, first of all, categorized into either proactive or responsive postings. Proactive postings were those initiated by a member on a certain topic while responsive postings were those that were in response to a question, comment or reply by another member. The postings were further classified into those that (i) concern events and artifacts (ii) deal with operational issues (iii) pertain to theoretical issues or (iv) deal with research concerns. Events/artifacts postings were those that either requested or provided information or commented on information regarding events such as conferences or artifacts such as publications, computer software, bibliographies, etc. Postings on operational issues pertained to questions, comments or responses dealing with the computer program that ran the electronic forum. for instance, comments regarding problems in accessing information from COMSERVE. Theoretical or research postings were those that raised questions or commented on theoretical or research issues respectively. The volume of exchanges was determined by the number of lines in each type of posting. The participant interest was assessed by the number of responses and average volume per response. Using these categories, the postings on the CMC hotline were analyzed and coded.

Discussions in the synchronous forum:

Netoric Project and Tuesday Cafe in MediaMOO began in July 93 and the members have been regularly conducting discussions on various topics for the last 8 months. Logs of sessions conducted in two randomly selected months were accessed from the moderators of the project. Four sessions in August 1993 and four in February 1994 were thus obtained. Since the logs were a record of contributions by participants in the chronological order in which they were made, identifying the intertwined threads of interaction was the first step to analysis. A unit of interaction was defined as a comment or a question and the direct responses elicited by the question or comment. Through repeated readings of the logs, units were identified and numbered as best as possible. Further, the number of responses in each unit and the number of lines in each contribution were tabulated in order to calculate the response rate and the average volume of contributions. Although, a framework similar to the one used for the analysis of asynchronous forums was attempted by distinguishing between units of interaction pertaining to (a) events/artifacts, (b) operational issues, and (c) theoretical and (d) research issues, it was found that occurrence of units belonging to these four categories depended more on the topic of discussion. If the topic was a theoretical issue, there were more units of a theoretical nature but if the topic was a practical question, the participants tended to share their concrete experiences. Moreover, perhaps due to the 'conversational, informal' nature of the forum, even while discussing theoretical issues, participants tended to share their experiences, which arguably is 'theory in practice'. Hence, such a classification of the units was dropped from the analysis for lack of defensible distinctions between the categories.

RESULTS AND FINDINGS:

CMC HOTLINE ON COMSERVE:

A survey of messages exchanged on CMC hotline during the seven month period from 1 July 1993 to 31 January 1994 found that there were 283 messages from 136 subscribers, an average of 2 messages per contributor. The mean length of messages was 23.27 lines. Only a third of the subscribers contributed to the CMC hotline during this period. The membership in CMC hotline is international as demonstrated by the origin of the postings. As expected, 216 messages (76.33%) originated from the U.S; nevertheless, there were contributions from 14 other countries: 11 posts from Canada, 18 from

Sweden, 7 from Australia, 5 from Israel, 8 from Holland, 6 from U.K. and 12 from 8 other countries. Such international participation is indicative of the potential of the forum to bring together scholars from around the globe.

The classification of the content of these messages based on the three categories (a) events and artifacts(b) operational concerns (c) theoretical and (d) research issues is shown in Table 1. 149 messages (52%) pertained to the first category that described events such as conferences and symposiums or artifacts such as journals, articles, electronic servers, projects, computer software or bibliographies. These discretionary postings were usually lengthy as evidenced by the total volume of postings in this category (3779 lines or 57.39% of the total content). There is very little discussion in relation to these postings, as is evident from the low response rate to such postings (1.57).

On the other hand, 76 (26.86%) messages dealt with theoretical concerns of which 16 were proactive and 60 were responses. The response rate for proactive postings of this category was the high (3.75) indicating the interest

Table 1: Classification of Postings of COMSERVE - July 93 - Jan 94.

	No. of Messages	No. of Lines	Lines/ Message	Proactive messages	Response messages	Response/ Proactive
Events/Artifacts	149	3779	25.36	58	91	1.57
Operational Issues	22	104	4.73	4	17	4.25
Theoretical issues	76	2136	28.11	16	60	3.75
Research Issues	20	361	18.05	3	17	5.66
Other	16	205	12.81	4	12	3
TOTAL	283	6585	23.26	85	198	2.33

of members in theoretical issues. This is further supported by the volume of contributions in this category. The average number of lines per message was highest for these postings (28.1). Similarly, there were 3 proactive postings and 17 responses dealing with research issues. The response rate was highest for this category (5.66) with an average of 18.05 lines per message.

Postings pertaining to operational issues were fewer compared to the other two types - 22 messages (7.77%) which constituted merely 1.58% of the total volume of messages. The response rate however was highest (4.25) but the responses were brief with an average of 4.73 lines per message. It is quite normal to find that the people in cyberspace are very generous to requests for help from novices to the system.

Table 2: Classification Proactive messages on COMSERVE

	No. of Mgs.	No. of Lines	Lines/ Mg.	E/A lines/ mg.	OP lines/ mg.	THE lines/ mg.	RES lines/ mg.
Sharing Information	38	2022	53.21	42.9	0	140.8	0
Sharing Info. & requesting feedback	8	13.3	162.9	162.8	0	0	0
Raising issue for Discussion	11	407	37	30	0	46.43	17.33
Request research participation	5	264	52.8	91	0	13.5	0
Request information	38	272	7.16	7.4	5.75	6.75	0
Other	2	2	1	0	0	0	0

E/A = Events and Artifacts; OP = Operational issues; THE = Theoretical concerns; RES = Research issues; lines/mg. = Lines per message.

PROACTIVE MESSAGES:

Of the total 283 messages, 85 were proactive postings and 198 were responses, an average of 2.33 responses per proactive posting. Among the proactive postings (Table 2), there were as many messages (38) requesting information as there were postings that volunteered some information. The requests for information were brief (7.16 lines/message) and the vast majority (30 out of 38) of them were requests for information about an event or artifact. Those 38 discretionary sharing of information, on the contrary, were lengthy and consisted of 30.71% of the total content. Of the 38 postings, 34 pertained to events and artifacts and only 4 dealt with theoretical issues. There were 11 proactive postings that raised some theoretical or research issue for discussion. There were 8 postings where subscribers requested feedback on certain artifacts, for instance, members posted bibliographies requesting feedback to improve them. There were also five solicitations to participate in surveys or respond to research questions. The ways members actively use the hotline were diverse - request information or volunteer information, get feedback or discuss an issue or clarify a doubt, conduct research or post results of research findings.

RESPONSIVE MESSAGES:

There is considerable amount of goodwill among the participants of the hotline in responding to requests for information. Nearly half the responses have been either responding to requests by giving information or directions on where the information can be found. Of sources suggested by contributors in response to requests, 36 respondents suggested books or articles in print, 19 provided electronic sources where the information can be accessed and 5

Table 3: Responsive Messages in COMSERVE

	No. of Mgs.	No. of Lines	Lines/ Mg.	E/A lines/ Mg.	OP lines/ Mg.	THE lines/ Mg.	RES lines/ Mg.
Providing Information	48	1142	23.79	18.21	5.25	67	9
Directing to a source	45	4056	23.47	18.79	7.5	8.8	-
Asking for additional info.	18	88	4.89	3.4	5	6.2	-
Input to theoretical discussion	77	1673	21.73	35	8	22.07	18.75
Other	26	251	9.65	12.05	7	4	-

E/A = Events and Artifacts; OP = Operational issues; THE = Theoretical concerns; RES = Research issues; lines/mg. = Lines per message.

posted e-mail addresses of knowledgeable persons who could provide the information.

The above table (Table 3) clearly indicates that there is considerable interest in responding to theoretical issues. 25% of the total responsive content has been in relation to the discourse on various theoretical issues. The volume of posting measured by the number of lines is highest (22.07) for discussions of theoretical issues. Table 1 has already shown that the response rate for theoretical issues was high compared to other categories.

SYCHRONOUS FORUM: TUESDAY CAFE IN MEDIAMOO:

Logs of eight Tuesday Cafe sessions were analyzed to study patterns of interactions in these synchronous discussions. Table 4 provides an overview of the 4 sessions in August 93 and 4 in February 94. Counting the number of participants who made at least one contribution to the discussion, there was an average of 22 participants per session. Almost all of the participants were from the U.S. Tuesday Cafe, as the name suggests, has an air of informality, like a weekly meeting of colleagues in the local Coffee house. Hence, there were a number of interactions that were social in orientation. For the purposes of this analysis, only units of interaction pertaining to the topics of discussion were selected which comprised on an average 84.18% of the total session. After identifying relevant units, the number of responses and lines per unit were counted. From these data, response rate and the number of lines per response were calculated. An average of 6.65 responses were made to every comment or question. The mean length of the responses, however, was less than two lines (1.8). As expected, the responses were short but the

Table 4: Eight Tuesday Cafe Discussions

	Total Units	Topical Units	No. of Resp.	Resp. Rate	Line Volume	Lines/ Unit	Lines/ Resp.
Aug - 1	35	27	207	7.67	418	15.48	1.89
Aug - 2	45	36	262	7.28	605	16.81	2.17
Aug - 3	33	26	210	8.08	375	14.42	1.66
Aug - 4	45	41	211	5.15	468	11.41	2.02
Feb - 1	48	36	206	5.72	510	14.17	2.30
Feb - 2	45	39	262	6.72	425	10.90	1.47
Feb - 3	83	69	552	8.0	839	12.16	1.39
Feb - 4	58	56	256	4.57	429	7.66	1.46
MEAN	49	41.25	270.75	6.65	508.63	12.88	1.80

response rate was higher than in asynchronous forum (Table 1).

An overview of the logs also suggested potential disparities in participation. Although it can safely be assumed that those who sign on to a forum such as Tuesday Cafe are interested in a discussion of the topic, the extent of participation may be limited by several factors. Aside from individual differences, a person's familiarity with the system may be an important factor. Personal skills such as typing speed, the type of program (client) a person uses to access MediaMOO, experience with synchronous forums that helps a person to identify threads of interaction, personal relationships with the other participants developed over time, etc. may be factors that affect participation. The following table (Table 5) shows the differences in the amount of input by different users. The columns of the table show the number of par-

Table 5: Participation Rates in Tuesday Cafe Sessions

	<2%	2-4%	4-6%	6-8%	8-10%	>10%	Total
Aug - 1	7	2	1	2	2	4	18
Aug - 2	7	6	2	2	2	3	22
Aug - 3	5	2	1	2	4	3	17
Aug - 4	6	2	3	4	0	4	19
Feb - 1	14	7	4	1	1	2	29
Feb - 2	4	4	2	3	1	4	18
Feb - 3	16	9	5	1	1	1	33
Feb - 4	7	7	1	5	2	1	23
TOTAL	66	39	19	20	13	22	179
Total %	36.88	21.79	10.61	11.17	7.26	12.29	100.00

ticipants with different percentages of total input. A bigger portion of members (36.88%) contributed less than two percent of the total input. On the other hand, there were a few users in each session who contributed over ten percent of the total session(12.29%). This however, raises an important point concerning the nature of the medium itself. If all the participants were equal in terms of inclination as well as other factors mentioned above, is there an optimal number of participants whom the system can support? Perhaps yes, because as the number of inputs increases, text on each screen flows faster and hence there is arguably a limited number of persons who can actively participate in such a discussion.

DISCUSSION

The survey of the two electronic forums indicate that the scholars are using these not only to discuss the latest in technologies and exchange information but also to discuss theoretical and research issues which in turn becomes a catalyst for future research. Further, the argument that asynchronous forums have the potential to bring together scholars from around the globe is supported although there was very little international participation in the synchronous forum. This may be because the forum is fairly new although the differences in time-zones may affect a global participation in a synchronous forum. Table 6 delineates the apparent distinctions between the two forums.

Asynchronous forum provides greater control over the pace of interaction since the participants can read and respond if and when they choose. This can also be a disadvantage because if someone awaits an immediate response, he/she has no control over if and when a response will be forthcoming. Syn-

Table 6: Comparitive Characteristics
of Assynchronous vs Sycnchronous forums

ASSYNCHRONOUS	SYNCHRONOUS
greater user control over pace of interaction	time bound
potential for undesirable timelag	instant communication
More detailed discussion	shorter responses
lower response rate	higher response rate
more formal	informal, spontaneous
unlimited number of participants	limited number of participants
anonymous lurking easier	anonymous lurking is harder

chronous forum, on the other hand, is time bound but has capabilities of instant communication and feedback. Theoretical discussions are able to evolve and expand simultaneously with the thought processes of the participants. Asynchronous forum, however, gives the user enough time to deliberate a response. But on the flip side the participants can lose track of arguments in a prolonged discussion. The interactive nature of synchronous forums predisposes the participants to spontaneity and instant interaction, though the responses tend to be short and more casual. However, due to the nature of synchronous forums, these may support only a limited number of participants. As the number of participants increases, the speed at which the text flows on the computer screen increases. Beyond an optimal speed, it will be difficult for participants to read other comments and add their own. Generally, a theoretical question involves an in-depth response and perhaps even several follow-up questions to fully explicate all the concepts. A simple yes/no response rarely suffices and hence the pace of interaction may affect the quality of theoretical input in synchronous forums.

The theoretical topics in the asynchronous forum were unplanned and unstructured and were initiated by a posting by a member. On the other hand, topics for discussion in the synchronous forum were proposed by a member in advance and announced by the moderator. Such pre-planning may enable the participants to be prepared with questions and comments. However, asynchronous medium provides control over the pace of interaction and participants do have time to deliberate on their postings.

The response rates and the volume of postings for theoretical discussions suggest that such discussions elicited considerable interest among the participants of the asynchronous forum. This indicates the potential of the medium for a more structured use for theoretical discussions. Although the exact amount of theoretical content in synchronous forums could not be calculated, the topics were discussed from an academic standpoint with theoretical underpinnings.

However, if these forums should serve a function of theoretical dialectic both asynchronous and synchronous forums require further definition and structuring. The general subject of interaction for each hotline is defined but the type of activity as well as the scholastic orientation of the activity is left undefined. Tuesday Cafe, on the other hand, has a pre-defined topic for each session and the Netoric Project is oriented to those who use computers in teaching writing. Moreover, MediaMOO welcomes primarily those involved in media research. These definitions tend to attract a set of participants with similar theoretical and professional orientation. For instance, if there were a hotline that defined its primary activity as theoretical discussions for communication researchers, discussions that take advantage of the unique features of the asynchronous medium would become possible.

Similarly, synchronous forums would need further development to enable wider participation and more effective interaction. As we have seen earlier, one of the problems the users of a synchronous forum face is the difficulty in following the threads of interaction, especially because there is no structure for turn-taking. Hence, it is possible that there is a limited number of participants who can effectively participate in a synchronous forum in its present stage. However, MediaMOO is very much in its developmental stages. Computer programs are being developed so that the pace of interaction can be controlled by a moderator who would direct the participants to take turns. Programs that would identify the topic of each posting are also being developed that would enable the participants to follow the threads of interaction.

However, there may be other problems that need to be addressed by the Scholars' community before an electronic medium can serve the dialectic function. Issues regarding intellectual property rights need to be clarified before people would be willing to make original contributions. As long as the measure of productivity is based on the product, rather than the process (Potter, 1989) it may be just a pleasant but professionally unproductive activity. Moreover, unless a critical mass (Marcus, 1990) of scholars from any discipline adopts the forum as a venue for sharing and creating knowledge, no academic respectability will be forthcoming and its contribution and impact would remain insignificant. These forums would eventually lose their novelty and disappear unless an attempt is made to draw the academic community into active use of these forums for theoretical dialectic.

CONCLUSION:

Electronic media are being increasingly used by researchers and academicians to support their research and scholarly activities and to network with others with similar academic or research interests. However, this study argues that the unique capabilities of electronic media that are conducive to interactive dialogue are not being exploited. Such dialectic in cyberspace can lead to higher levels of knowledge and greater theoretical clarity and thus contribute to the advancement of scholarship. The two electronic forums that were surveyed in this study show that scholars are also using these forums for discussions on topics of theoretical and research interest. The interest demonstrated by the participation of scholars in such discussions suggest the potential of the medium to bring together scholars from around the globe to participate in a dialectic in cyberspace. Asynchronous and synchronous forums can contribute to this dialectic with their unique features. However, these forums need to be restructured to benefit effective knowledge creation and dissemination. They must be redefined incorporating appropriate polices on knowledge ownership and on-line scholarship, these forums may have very little usefulness to the discipline as a whole.

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Does the Sun Shine in Cyberspace?
Electronic Access and State Open-Meetings Laws

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Introduction

Presidential politics in 1992 helped to focus new attention on electronic access to and participation in government decision-making (Becker 1993, 15). Candidates George Bush, Bill Clinton, and Ross Perot used "electronic town meetings" to present their ideas simultaneously to groups in different geographic locations. Perot proposed, if elected, to make use of electronic plebiscites and electronic polls to allow citizens to participate directly in government decision-making (Moshavi 1992, 19). Clinton, since his election as president, has used "electronic town meetings" in the United States and even in Russia to present his views and policies.

Production of "electronic town meetings" is one use of video conference technologies that expand the notion of the telephone conference call and allows participants to see as well as hear and talk to other participants at different meeting sites. Video conferences also are in use for business meetings, job training, and "distance learning," with teachers and their students at different schools. Broadcast television, cable television, and now digital imaging with computers can provide the medium for visual interaction among conference participants. Digital technology transforms television images into series of numbers that computers can store, process for viewing, or send to computers at other sites for processing. Computer imaging offers prospects for greater video conference use in business, education, and government (Weintraub 1993, 46).

Broadcast and cable television technologies have allowed citizens at remote sites to interact with government officials for nearly twenty years (Moss 1978, 160). Alaska in 1978 pioneered state government use of video conferences because of distance, transportation, and climate problems in bringing state officials as well as citizens together for meetings (Slaton 1992, 110). A Florida attorney general's opinion in 1992 noted that use of communication technology to conduct government meetings, "once considered experimental and controversial, is now commonplace" (1992 Op. Att'y Gen 31). Washington Governor Jack Lowry in January 1994 issued an executive order to curtail state travel expenses and listed use of video conferences as the top priority for alternatives to travel for state business (Culp 1994).

This article will examine legal authority for use of telephone conference calls and video conferences to conduct public meetings in the fifty states and the District of Columbia and will analyze pertinent legal issues. Statutes, court decisions, and advisory legal opinions in nearly half of the states have limited or barred use of telephone conference calls and video conferences to conduct public meetings. Authority for their use in almost a dozen states is unclear. This review comes as several states, in an attempt to boost economic development, are allocating hundreds of millions of dollars to build communication networks for high-speed transmission of computer data including digital imaging for video conferences.

With legal barriers currently in place, some state governments may not be able to make full use of available technology, particularly to conduct public meetings with electronic conferences or to provide electronic access to government meetings. Questions about a right of electronic access may become more important if proposed advances in computer systems and communications networks allow some citizens to use video conference systems in their homes or businesses to observe and participate in government meetings while others will have limited or no such opportunities. State legislatures easily could remove most of the present legal barriers to use of electronic conferences for public meetings.

Electronic access

Since the 1970s, governments have used broadcast and cable television to encourage public participation in policy-making with state projects in Alaska (Slaton 1992, 110-11), Oregon (Becker 1993, 18), and New Mexico (Becker 1993, 19) and local projects in Reading, Pennsylvania (Brownstein 1978, 145); Honolulu, Hawaii (Becker 1993, 16); and Savannah, Georgia (Becker 1993, 17). Several states have built video conference centers and purchased video conference systems for a variety of purposes that include in-service training, distance learning, and public participation in policy-making (Weintraub 1993, 44-45). The National Association of Counties and the National League of Cities have established video conference systems to improve services to their member governments ("County-to-County" 1993, 1). A consortium of the National Conference of State Legislatures, the National Council of State

Governments, and the National Governors' Association is developing a policy proposal for increased uses of interactive technologies to provide government services (Varn 1993, 24). State governments in Hawaii, Kentucky, Texas, and New Mexico and the city government of Santa Monica, California, are providing interactive services through information networks that allow citizens to use their computers at home, at work, or at public sites to gain access to government records and services and to exchange electronic messages with government officials and employees. New Mexico's information network, Technet, already provides video conference services for education (Woods and McDonald 1990, 36)

State investments

Use of digital imaging for video conferences, medical research, or product design requires transmission of millions of bits of computer data, and state legislatures are investing millions of dollars to build high-speed, data-transfer networks to attract economic development and to link medical, educational, and research facilities. North Carolina has announced one of the more ambitious projects, the North Carolina Information Highway, a public-private project for which BellSouth, a regional Bell operating company, already has allocated nearly $70 million and the North Carolina legislature has provided more than $4 million (Wexler 1993, 73). The first phase of the project, which will cost a total of $160 million (Wallace 1993, 2), will link 106 sites in the state with the first large-scale use of high-speed, data-transfer technologies that provide the highest quality of computer transmission of video images now available (Wexler 1993, 73). Promoters of the North Carolina project explain the speed of the new data-transfer systems with the illustration that the transmission time for the contents of the thirty-three volumes of the Encyclopedia Britannica will decline from thirteen hours, using present technologies, to 4.7 seconds (BNA 1993, 1).

A number of states have entered the competition to provide communication networks for interactive services. Iowa already has committed $200 million to development of its high-speed communications network (Feder 1993, D1), and Minnesota may spend as much as $100 million for its communications system (Cariess 1992, 40). North Carolina and Iowa statutes allow use of video conferences for public meetings, but legal authority for use of electronic conferences in Minnesota is not clear.

While some states are paying or sharing the costs of new communication networks, other states such as Tennessee have, with regulatory decisions, encouraged private investment in these networks. The Tennessee Public Service Commission through its "FYI Tennessee" program eased restrictions on earnings to allow telephone companies in the state to commit more than $100 million to full conversion of their telephone systems to digital service (Ezell 1994, 10). Telephone companies throughout the country have announced plans to spend billions of dollars upgrade their systems for video services (Gerwig 1993, 3A) as the cable television industry studies technology advances that can transform cable television systems into providers of interactive services in competition with computer and telephone networks. While states are investing in or sanctioning individual projects, Congress and the Clinton administration are studying development of a "national information infrastructure" with audio, video, and data-transfer capabilities that may allow electronic access from homes and businesses to public meetings and other government services.

Cost-savings

Video conferences already offer convenience, and businesses, as well as state governments, are using video conferences to reduce travel costs. Proponents of video conference use in business and government indicate that the reduction in travel costs to meetings and for government in-service training or services will help offset costs for the electronic conferences (Johnson 1993, 10). Industry analysts project increased government and business use of video conferences as costs decline for video conference equipment that includes cameras, monitors, and transmission equipment. While production of video conferences in the past required specially equipped centers that served as miniature television studios, "desktop" personal computers, with their monitors and appropriately sized television cameras, can now provide the transmission link for a video conference. While the expense of a specially equipped room for video conferences may be $60,000 (Shafer 1993, 242), a computer company in early 1994 introduced a $2,500 video conference system for use with a personal computer (Fryer 1993, 30). The company in March 1994 reduced the cost of the video conference system to $999 for new digital telephone service customers of Pacific Bell in California ("Intel" 1994, C3). The digital telephone service allows data transfer between computers without use of modems. Declining costs for video conference systems prompted one industry analyst to predict a significant increase in use of video conferences with earnings for manufacturers of video conference equipment quadrupling from $800 million in 1992 to $3 billion in 1995 (Francis 1993, 50).

Although costs for video conferences are declining, state and local governments may face some limits in their use to conduct public meetings. Legal restrictions including state open-meetings laws may prevent or limit use of video conferences for meetings of governmental bodies. Authority to use electronic conferences for public meetings in Kansas was unclear (Folmsbee 1994) until the state legislature in March 1994 amended the definition of "meeting" to include "telephone call or other means of interactive communication" (Kan. Stat. Ann. § 75-4317a [1994]).

Kansas legislators acted after the state supreme court said in January 1994 that the state's definition of a meeting required members of a governmental body be in the physical presence of each other. The court in a ruling on use of telephone conferences calls to circumvent open-access requirements had held that "parties to a telephone conversation are not within the ordinary meaning of a gathering or assembly" (254 Kan. 446, 449) and the open meetings law did not apply to such calls.

Legislature in Hawaii and Kentucky early in 1994 also approved use of video conferences to conduct public meetings. The definition of "meeting" in Kentucky's open-meetings law had been "all gatherings of every kind, regardless of where the meeting is held" (Ky. Rev. Stat. Ann. § 61.805 [Baldwin 1993]), but Kentucky's attorney general had said in 1992 that governmental bodies could not use telephone conference calls to conduct public meetings (92 Op. Att'y Gen. [1992]). Changes in communication and computer technology are putting electronic access at odds with earlier state efforts to increase public access to meetings of governmental bodies. Of particular concern in nine states [1] has been use of electronic means, such as telephone calls and electronic-mail systems on personal computers, to circumvent requirements for public access to meetings of governmental bodies.

Open government

While Alabama's legislature enacted the nation's first open-meetings law as early as 1915, most federal and initiatives on open government did not come until after the Vietnam War era and the Watergate scandal of the 1970s brought calls for more public access to government decision-making and for greater accountability of government officials. The federal Government in the Sunshine Act in 1976 helped to increase public access to federal government decision-making. Every state and the District of Columbia has enacted an open-meetings law, but the laws vary greatly in form and content. Differences include what state and local government bodies are subject to their provisions, provisions, if any, for executive sessions, and penalties for failure to comply with their provisions for openness, The statutes differ even as to the definition of a "meeting," and those differences affect use of electronic conferences.

Review of jurisdictions

A review of statutes, case law, and advisory legal opinions in the fifty states and the District of Columbia shows that governmental bodies in twenty-one states and the District of Columbia have full authority to use video conferences. The review shows limited authority for use of video conferences for public meetings in eighteen states and no authority for electronic conferences in three states. Legal authority for the use of video conferences in eight states is not clear. **See Table 1.**

Statutory authority for full use of video conferences is present in fourteen states. Ten of these state open-meeting laws, by their definition of "meeting," allow members of governing bodies to convene through use of electronic means, including telephone conference calls and video conferences. Other sections of open-meeting laws in three states, Hawaii, Oregon and Vermont, provide general authority for use of electronic conferences for public meetings if the meetings are in compliance with all other provisions of their open-meetings acts. Oregon also extends use of electronic conferences to executive sessions. Although the Washington open-meetings law contains no specific authority for use of electronic conferences, the statute that created the Department of Information Services directs the department to oversee use of "voice, data, and video telecommunications technologies" for "interactive public affairs presentations" and to "reduce time lost due to travel to in-state meetings."

Despite lack of specific statutory authority, supreme courts in Arkansas and Pennsylvania, the Michigan Court of Appeals, and a federal district court for the District of Columbia have held that open-meetings laws in these jurisdictions permit use of electronic conferences. Video conferences of these governmental bodies have to comply with other provisions of the open-meetings laws in the jurisdictions such as notice and the ability of all at the meeting to hear all others at the meeting.

Opinions of attorney generals in Illinois, Nevada, Ohio, and Wisconsin also have approved of use of electronic conferences to conduct public meetings if they meet other provisions of the states' open-meetings laws. An attorney general's opinion in Illinois in 1982 noted that changing technologies required new viewpoints on convening of governmental bodies:

> [I]t is also evident that, with the technologies presently available, a group of persons may come together by non-corporal means as well. One would have to ignore the common practice of modern government to exclude the telephone conference call as means by which public officials 'gather' to conduct public business" (82 Op. Att'y. Gen. 124 [1982]).

Statutes and attorney general opinions in eighteen states limit such use of telephone conference calls or video conferences for public meetings. The open-meetings law of Alaska, which pioneered use of electronic conferences, authorizes all government bodies but the state legislature to conduct public meetings with video conferences. Among other states that restrict use of telephone conferences and video conferences, limits may include authority only for certain types of governmental bodies, use only during emergency situations, use for specific types of action, or authority for a single department or agency.

Open-meetings statutes in Georgia, Tennessee, and Virginia limit use of electronic conferences to state departments and agencies. In 1993, the Nebraska legislature gave authority for electronic conferences to all state agencies for regularly scheduled meetings, but the open-meetings law still provides that all governmental bodies in the state can use electronic conferences in case of emergencies.

The New Mexico open-meetings law allows use of telephone conferences "when it is otherwise difficult or impossible for the members to attend the meeting in person." California's open-meetings law limits the use of video conferences to "receipt of public comment and testimony by the legislative body and deliberation of the public body." South Dakota's open-meetings law allows all governmental bodies to use of electronic conferences but restricts their use for "conducting hearings or taking final dispositions" in administrative rule-making procedures unless the state's rural telecommunications network conducts the electronic conferences.

Some states' open-meetings laws do not contain any general provisions for use of telephone conferences or video conferences for government meetings, but other state statutes permit such meetings for specific agencies. Statutes in Alabama, Maryland, Missouri, Oklahoma, Texas, West Virginia, and Wyoming grant authority to a limited number of agencies for telephone conferences and video conferences. The Texas attorney general in 1986 issued an opinion that "in the absence of specific legislative authorization a governmental body that meets by telephone conference call will not comply with the Texas Open-Meetings Act." The Texas legislature, so far, has granted such authorization to the Governing Board of Institutions of Higher Education, the Texas High-Speed Rail Authority, the Board of Criminal Justice, and the Board of Pardons and Paroles.

The Oklahoma open-meetings law permits two state government bodies, Oklahoma Futures and the Oklahoma State Regents for Higher Education, to conduct electronic conferences for public meetings. Specific authorization for use of electronic conferences to conduct meetings also is in laws that created the County Industrial Development Authorities in Alabama, Maryland's Parole Commission and Inmate Grievance Committee, the West Virginia Disaster Recovery Board, the Wyoming Community Development Authority, and the Missouri Veterinary

Medical Board. The Missouri legislature in 1993 defeated legislation that would have extended authority for use of electronic conferences to all governmental bodies in the state.

The Florida open-meetings law also contains no specific references to electronic conferences, but other Florida statutes have provided limited authority for such conferences. One Florida statute specifically allows the state's Waterfowl Advisory Board to convene through video conferences, and the state's administrative procedure act requires state departments to develop guidelines to use "communications media technology" to conduct hearings and meetings. The Florida attorney general also has issued opinions that members of other governmental bodies may use electronic means to participate in public meetings if the governmental body meets other statutory requirements that may apply, such as the need to convene a county commission meeting at a public site.

State courts have not addressed limited use of electronic conferences, but attorney generals' opinions in two states, Mississippi and Arizona, restrict use of electronic conferences for public meetings. An attorney's general opinion in Mississippi limits use of electronic conferences to situations in which a quorum of members already is physically present at a public meeting site. The Arizona attorney general said that electronic conferences are permissible only if no other reasonable alternatives for conducting a meeting exist.

Only in three states have statutes, court holdings, or advisory legal opinions prohibited use of electronic conferences to conduct meetings. Massachusetts is the sole state whose definition of "meeting" specifies corporal or physical "convening and deliberation of a governing body. The Louisiana Court of Appeal have held that telephone conferences do not comply with provisions of those states' open-meetings laws. An advisory opinions of the Committee on Open Government in New York also have found that telephone conferences do not fulfill open-meeting requirements.

In eight states, legal authority for use of video conferences to conduct meeting is not clear. Statutes, court holdings, and attorney generals' opinions in Delaware, Idaho, Indiana, Maine, Minnesota, New Hampshire, North Dakota, and Rhode Island make no reference to the use of electronic conferences.

Legal issues

Questions about whether use of electronic conferences complies with public-access requirements for government meetings have resulted in legal challenges. Although the U.S. Supreme Court has held that citizens have a constitutional right to attend trials (448 U.S. 555, 581[1980]), the Court has not yet found a similar constitutional right of access to governmental meetings (417 U.S. 817, 834-35 [1974]). State statutes and their judicial interpretations establish the conditions of public access to governmental meetings in each state. As the Kansas Supreme Court said early in 1994, statutory language is key to the nature of these conditions in each state:

> Preliminarily, we note there is no common-law right of the public or press to attend meetings of governmental bodies, and any such right is created by statute and is governed by the statutory language employed (1994 Kan. Lexis 21, 1).

Although legal authority for use of electronic conferences for public meetings has been the subject of only a few state court cases and advisory legal opinions, principal legal issues have included such conditions as whether physical presence of members of a governmental body is necessary to convene a meeting, whether use of an electronic conference fulfills statutory requirements to convene in a public place, and whether electronic conferences meet all other provisions of open-meetings laws including notice, availability of agendas, and public access. Challenges to use of telephone conference calls or video conferences for adjudicative and administrative hearings also have included claims that the electronic conferences do not comply with other location requirements such as the right of citizens to have hearings in their home counties or to have the hearing officer at the site with them. At least one court, in Florida, has said that citizens do not have a right to electronic access to government meetings if physical access also is available.

Questions about what constitutes presence at a meeting has resulted in court challenges to actions at meetings and hearings in several states. Courts have examined both the intent of legislatures in enactment of open-meetings laws and whether general definitions of meeting, gathering, or assembly apply when electronic equipment is in use to provide two-way communication among members of a governmental body or members of the governmental body and the public. Their decisions on what constitutes presence have varied.

The Pennsylvania Supreme Court in 1992 combined two related cases to overturn holdings from a lower court that a telephone conference call among members of a milk marketing board could not serve as a quorum for a meeting to set milk prices. Pennsylvania's open-meetings law defines "meeting" as "any pre-arranged gathering of an agency which is attended or participated in by a quorum of the members." In its rulings in the two related milk-price cases (136 Pa. Commonw. 621 [1990]; 136 Pa. Commonw. 681 [1990]), a Pennsylvania Commonwealth Court said that without specific legislative authorization a telephone conference could not establish a quorum for a meeting. The Pennsylvania Supreme Court, in overturning those rulings, held that the state's open-meeting law "does not mandate that (Milk Marketing) Board members be physically present at such meetings" (531 Pa. 391, 395 [1992]). The court held that a meeting quorum can include members not physically present at the meeting if all members are able to hear the comments of and speak to other members and those present at the meeting can hear and address absent members. The court said that "participation by speaker telephone clearly satisfies this mandate" (531 Pa. 391, 395 [1992]).

The Kansas Supreme Court in January 1994 took the opposite position in its interpretation of the definition of "meeting" in the Kansas open-meetings law. The Kansas open-meetings law, prior to amendment in March 1994, had defined "meeting" as "any prearranged gathering or assembly by a majority of a quorum of the membership of a body or agency subject to this law." The court in a open-meetings law challenge to use of telephone calls between two of three members of a county commission said that "inherent in the ordinary mean of 'gathering' or 'assembly' is the requirement that persons at a gathering or assembly are in the physical presence of one another" (254 Kan. 446, 450 [1994])). The court held that since the legislature had not included telephone calls in the open-meetings law's definition of meeting, a "meeting" requires the gathering or assembly of persons in the presence of each other. The court declined to include telephone calls under the provisions of the act. "If they (telephone calls) are to be included, it is up the legislature to do so" (254 Kan. 446, 451 [1994]). The Kansas legislature in March 1994 expanded the definition of "meeting" in the open meetings law to "any gathering, assembly, telephone call, or any other means of interactive communication by a majority of a quorum of the members of a body or agency subject to this act" (Kan. Stat. Ann. § 75-4317a [1994]).

Similar court interpretation of meeting definitions in two states also resulted in corrective legislative action. Court rulings in Vermont in 1978 (394 A. 2d 1360) and in Virginia in 1983 (226 Va. 185) held that the states' open-meetings laws did not authorize use of telephone conferences for public meetings. The Vermont Supreme Court said with the use of telephone conference calls "the personal contact that is so often an effective ingredient of a meeting is absent" (394 A. 2d 1360, 1361). The Virginia Supreme Court held that regardless of "one's preferred definition, whether it be coming together, assembling, gathering, or meeting, the physical presence of the participants is essential. A telephone conference call does not qualify" (226 Va. 185, 195). Subsequent to the courts' decisions, the legislatures of Vermont and Virginia amended their statutes to allow use of telephone conference calls to conduct meetings in compliance with other provisions of the open-meetings laws. The Vermont law in its definition of "meeting" specifies use of "audio conferences or other means," and the Virginia law's definition of "meeting" permits use of "telephonic or video equipment." Virginia limits use of electronic conferences to state governmental bodies.

An attorney general's opinion in Mississippi permits off-site members of a governmental body to participate in meetings through video conferences. A sufficient number of members of a governmental body, however, has to be present physically at an appropriate meeting site to constitute a quorum (91 Op. Att'y Gen. 210 [1991].

Questions about appropriate sites for meetings have been the subjects of conflicting Florida attorney generals' opinions on use of electronic conferences for government meetings. A 1992 attorney general's opinion said a member of a county commission could participate in a commission meeting from another site since she was undergoing medical treatment and was unable to attend the meeting (92 Op. Att'y Gen. 44 [1992]). Attorney generals' opinions in 1983 (83 Op. Att'y Gen. 267) and 1989 (89 Op. Att'y Gen. 39) had indicated that county commissions could not conduct meetings through telephone conferences. The earlier opinions, however, were the result of a statutory requirement for specific location of county commission meetings (Gleason 1994). A Florida statute requires that regular and special meetings of county commissions "be held at any appropriate public place in the county" (Fla. Stat. ch. 125.001[1993]). The 1992 Florida attorney general's opinion indicated that participation of an off-site member was permissible since a quorum was present physically at an appropriate meeting site. Since Florida statues do not include a specific requirement for location of meetings of municipal governmental bodies (Gleason 1994), an informal Florida attorney general's opinion on use of electronic conferences in 1982 had allowed an off-site member to participate by telephone in a televised city commission meeting (Inf. Op. to Byron W. Henry).

Legal challenges to use of telephone conferences and video conferences to conduct state administrative and adjudicative hearings have come in appeals of denials of welfare claims and unemployment benefits. The Michigan Court of Appeals held that a telephone hearing for a welfare claim did not violate the state's open-meetings law as long as speakerphones were in use and said such a communication system actually might increase access to the proceedings (143 Mich. App. 756 [Mich. Ct. App. 1985]). Courts in Oregon (72 Or. App. 486 [Or. Ct. App. 1985]) and the District of Columbia (513 A. 2d 253 [D.C. 1986]) also have held that use of telephone conferences for unemployment compensation hearings did not violate the jurisdictions' open-meetings laws. Illinois appeals courts in two cases, however, held that telephone hearings violated statutory provisions for in-person appeals of denial of welfare claims (466 N.E. 2d 703 [Ill. App. Ct. 3d 1984]; 475 N.E. 2d 1068 [Ill. App. Ct. 2d 1985]). The Illinois courts also held that the telephone hearings violated the claimants' rights to a hearing in their own counties since the hearing officer was in another location. In 1993, a lawsuit in Hawaii challenged use of video conferences for administrative rule-making proceedings. The state's administrative procedures act does not include any references to video conferences, but the

Hawaiian Supreme Court did not rule on the specific access issues and held that the contested hearing had been in compliance with the administrative procedures act (863 P. 2d 344 [1993]).

Questions about members of governing bodies using electronic means to circumvent open-meetings laws have produced most of the case law and advisory legal opinions on electronic access. The issue of a right of citizens to electronic access to meetings has come before a state court on at least one occasion. Although the challenge came on the basis of an open-records law rather than an open-meetings law, a Florida appeals court found no right of electronic access to meetings if physical access is available. A county government in Florida provided a closed-circuit audio system to allow county staff members to listen to county commission meetings. County employees could listen to the commission meetings by dialing a telephone number that also was available "to certain individuals in the public and private sector who could should show a specific need therefor" (504 So. 2d 1315, 1316 [1987]). A citizen 's sued in 1987 to obtain the telephone number and the list of those who had received the number as public records. The court said the plaintiff did not have a right to electronic access: "It should be kept in mind that the commission meetings are recorded so that the public can obtain copies thereof, and the meetings are open to the public so all can observe the proceedings. Thus, there is no fear that the public will not know what goes on" (504 So. 2d 1315, 1317 [Fla. App. 1987]).

Conclusions

Laws enacted principally in the 1960s and 1970s to provide more physical access to government decision-making are, in some states, limiting opportunities to increase access to meetings through electronic means. Technologies that once posed a threat to openness of government now may help to open government further. States legislatures should remove the uncertainty and confusion about authority for electronic conferences and provide safeguards to ensure equal access for all citizens. With use of "desktop" video conference systems, individuals may be able to monitor or participate in govern decision-making from their homes or businesses. States could find greater citizen involvement a good return on their investments in communication systems.

Present barriers to full use of video conferences for public meetings include uncertainty about specific authority in state open-meeting laws. Some state open meeting laws make no reference to electronic conferences. Some uncertainty stems from language of open-meeting statutes that fails to reflect changes in communication systems. Court holdings and attorney generals' opinions have indicated, for example, that participation in an electronic conference does not constitute the necessary physical presence for establishment of a quorum under the provisions of their state's open-meetings laws.

Court holdings, so far, also indicate that to authorize video conferences many state legislatures may have to do no more than amend their statutes to include "electronic means" or a comparable phrase as a way to gather or assembly in their definitions of "meeting." Legislatures in Kansas, Vermont and Virginia took that action after supreme courts in those states held that electronic conferences did not meet provisions of their open-meetings laws. Addition of video conferences as means to conduct open meetings may require additional safeguards to guarantee equal access for all those who want to attend government meetings.

Use of different meeting sites requires adequate notice of the location of those sites and provision of agendas and other meeting documents to those who attend meetings at all sites. Government bodies should require that all participants in the meeting be able to see and hear other participants at all sites and at all times during the meeting. A new section of the Kentucky open-meetings act requires suspension of a meeting if the audio or video broadcast fails during a teleconference, and such a requirement provides full access for all participants in a meeting.

Some states have opted to limit use of video conferences to certain governmental bodies or certain purposes or to provide authorization on a case-by-case basis. Those legislatures should consider a general authorization for video conferences with appropriate safeguards. Declining costs should make their use more feasible for more state governmental bodies and even for local governments.

As video conferences move from specially equipped centers to personal computers and workstations, opportunities for access points to government are increasing. Further development of high-speed, multi-media communications networks, which states are building or helping to build, should allow video conference access to government meetings from interactive home communication systems. Council members or legislators may be able to meet with their constituents at sites in their districts and then assemble electronically with their colleagues to conduct city or state business. Legislatures in those states that bar or severely limit use of video conferences for public meetings should consider if they are making the best use of their investments in information networks and communication systems and of their states' human resources.

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[1] Hawaii, Nebraska, New Jersey, North Carolina, Oklahoma, Rhode Island, South Carolina, Tennessee, and Virginia.

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TABLE 1

Permits full use of electronic conferences for public meetings	Limits use of electronic conferences for public meetings	Prohibits use of electronic conferences for public meetings
STATUTORY		
[General open meetings statute]	[Specific action]	[Definition of meeting]
Hawaii – 1994 Haw. Session Laws 121	**California** – Calif. Gov't Code § 54953 (1993)	**Massachusetts** - Mass. Ann. Laws ch. 39 § 23A (Law Co-op. 1993)
Oregon – Or. Rev. Stat. § 192.670(2) (1993)	[Limits for administrative rule-making]	
Vermont – Vt. Stat. Ann. tit. 1 § 312 (1993)	**South Dakota** – S.D. Codified Laws Ann. § 1-25-1 (1993)	
[Definition of meeting]	[Emergency conditions]	
Colorado – Col. Rev. Stat. § 24-6-402 (1993)	**New Mexico** – N.M. Stat. Ann. § 10-15-1(c) (Michie 1993)	
Connecticut – Conn. Gen. Stat. § 1-18a (b) (1193)	[Excludes state legislature]	
Iowa – Iowa Code § 21.2 (1993)	**Alaska** - Alaska Stat. § 44.62.310(e) (1993)	
Kansas – Kan. Stat. Ann. § 75-4317a (1994)	[Limits to state governmental bodies]	
Kentucky – Ky. Rev. Stat. § 61.805 (Baldwin 1994)	**Georgia** – Ga. Code Ann. § 50-14-1(f) (1993)	
Montana – Mont. Code Ann. § 2-3-202 (1993)	**Nebraska** – Neb. Rev. Stat. § 84-1411(2) (1993) *See also* Neb. Rev. Stat. § 84-1411 (4) (1993), provides for other emergency meetings	
New Jersey – N.J. Rev. Stat. § 10: 4-8(b) (1993)		
North Carolina - N.C. Gen. Stat. § 143-318.10 (1993)	**Tennessee** – Tenn. Code Ann. § 8-44-108 (1993)	
South Carolina – S.C. Code Ann. § 30-4-20(d) (Law Co-op. 1993)	**Virginia** – Va. Code Ann. § 2.1-341 (1993)	

Permits full use of electronic conferences for public meetings	Limits use of electronic conferences for public meetings	Prohibits use of electronic conferences for public meetings
STATUTORY		
Utah – Utah Code Ann. § 52-4-2(i) (1993) [Other statutes] **Washington** – Wash Rev. Code § 43.105.017 (1991)	[Authorization for specific agencies] **Alabama** - Ala. Code § 11-92A-9(f) (1993) **Florida** – Fla. Stat. § 372.5714 (1992) *See also* Fla. Stat. §120.52 (1992) and 1992 Op. Att'y Gen. 31 (1992) **Maryland** - Md. Code Ann. (Local Govt.) § 10.211(1993) **Missouri** – Mo. Rev. Stat. § 340.206(3) (1992) **Oklahoma** - Okla. Stat. tit. 25, § 307.1 (1993) **Texas** - Tex. Govt. Code Ann. § 551.121 through 551.124 **West Virginia** – W. Va. Code § 15-5-4(d) (1993) **Wyoming** – Wyo. Stat. § 9-7-104 (1993)	

Permits full use of electronic conferences for public meetings	Limits use of electronic conferences for public meetings	Prohibits use of electronic conferences for public meetings
CASE LAW		
Arkansas – Rehab Hospital Services Corp. v. Delta Hills Health Service Agency 285 Ark. 397 (1985)		**Louisiana –** Mix v. Board of Supervisors of Elections, Parish of Orleans 337 So. 2d 533 (La. Ct. App. 1976)
District of Columbia – Sterling v. D.C. 513 A. 2d 253 (D.C. 1986)		
Michigan – Goode v. Dept. of Social Services 143 Mich. App. 756 (1985)		
Pennsylvania – Babac v. Pennsylvania Milk Marketing Board 531 Pa. 391 (1992)		
ATTORNEY GENERAL OPINIONS *		
Illinois - 82 Op. Att'y Gen. 124 (1982)	[When no other reasonable alternatives exist]	**New York** - Comm on Open Gov't OML-AO-1446. * The New York Committee on Open Government issues advisory opinions on implementation of the state's open meetings law.
Nevada - 1985 Op. Att'y Gen. 90 (1985)	**Arizona** - 1991 Op. Att'y Gen. 107 (1991)	
Ohio – 85 Op. Att'y Gen. 48 (1985)	[Allows electronic participation if quorum physically present]	
Wisconsin – 69 Op. Att'y Gen. 143 (1980)	**Mississippi** - 91 Op. Att'y Gen. 210 (1991)	

Statutes, case, law, and attorney general opinions in the following state make no reference to authority for use of electronic conferences to conduct public meetings:

Delaware

Idaho

Indiana

Maine

Minnesota

New Hampshire

North Dakota

Rhode Island

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PLAY THEORY AND THE NEWS CONTENT OF INTERACTIVE MEDIA

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ABSTRACT

Play Theory and the News Content of Interactive Media

As any child knows (but we adults sometimes forget), using a computer is "fun." Media that use a computer to deliver information provide an opportunity to explore William Stephenson's play theory of mass communications. They encourage exploration. They respond instantly to individual input. Without the requisite acts of self-enhancing personal choice, they just sit there. Yet in some ways, interactive media also are work. For both user and journalist, they offer intriguing ways to conceptualize what one does with the news.

PLAY THEORY AND THE NEWS CONTENT OF INTERACTIVE MEDIA

Ask just about any child why he or she likes to use a computer and the answer probably will boil down to: "Because it's fun." The child is, as usual, right. The computer is absorbing; it is involving; it encourages choices and provides immediate gratification for those choices. Most children (or adults, for that matter) may not yet think of the computer as an information medium, though it's likely they do think of it as a form of entertainment. But the computer already is one of the most powerful and pervasive means of communication, and it is increasingly being used to deliver news in both the traditional sense of "information about major events" and the evolving sense of "information important to me." This paper will look at some of the ways interactive media (media whose audience accesses content through a computer) affect how we approach the news, both as consumers and as journalists, particularly in terms of William Stephenson's play theory of news reading.

Communications theorists are just beginning to turn their attention to the emerging field of interactive communication, a medium that still is very much in the process of defining itself. A number of ideas about mediated communication, all of which evolved from the study of print and broadcast media, may prove fruitful. For example, a "gatekeeper" approach might lead to questions about the journalist's role in an environment in which every individual can select desired information from a vast array; in a related vein, an agenda-setting focus would call into question the implications for potential fragmentation of the democratic polity when each member of the public can set his or her own personal agenda of salient issues. Those inclined toward a co-orientation model might concentrate on the computer's ability to connect individuals and to find others of a like mind. Some work already has been done in relation to the knowledge-gap hypothesis, as both scholars and policymakers have become increasingly concerned about the widening gulf between those with access to the much-touted "information superhighway" and those without such access or the means to acquire it.

All these, and others besides, are valid theoretical approaches to interactive media and their potential effect on our society. But they do not quite get at the starting point, at what perhaps is the heart of the matter: what the individual does with this new form of communication. Perhaps no other existing theory so lends itself to the holistic yet individualized nature of the online media experience as Stephenson's idea, which was rooted in his desire both to explore the complexity of the human mind and to consider psychological events in their totality.[1]

PLAY THEORY AND MASS COMMUNICATION

Stephenson, a physicist and a psychologist before becoming a communications scholar, drew on a variety of sources in a variety of fields in forming the concepts described in his book, The Play Theory of Mass Communication, as well as in other writings. Two of the most influential were social psychologist George Herbert Mead and Dutch cultural historian Johan Huizinga. Although Mead is not specifically cited in Play Theory, his views about the centrality and the formation of the self lie at the heart of Stephenson's work. Mead saw the self as an active force in the formation and control of behavior. We are both a result and a shaper of social processes. We interpret symbols so we can share meanings, and we use those shared meanings to create ourselves within the context of our society. In effect, Mead said, we acquire the ability to think through social interaction; we define our roles in terms of others and thus are the product of at least some degree of social control.[2]

Stephenson also saw the individual as key, and the communication among individuals as a means to foster mutual socialization.[3] Stephenson's existentialist framework is based on the idea of the self as an active force, a doer rather than an object to which something is done. He also makes use of Mead's idea of social control, particularly in the formation of public opinion.[4]

From Huizinga, Stephenson drew a number of ideas about play and, in particular, the view that play is fun in and of itself, regardless of any other functions it may serve. Huizinga saw play as not only a social construction but a primary basis of civilization. "You can deny, if you like, nearly all abstractions: justice, beauty, truth, goodness, mind, God," said Huizinga. "You can deny seriousness, but not play."[5] Huizinga outlined several characteristics of play in his book Homo Ludens, characteristics Stephenson later applied to media use. (Perhaps to his detriment, as one scholar suggests in an introduction to the second edition of Play Theory; not only was Huizinga unlikely to have applied his ideas to news reading, but he virtually ignored more unstructured aspects of play such as daydreaming or imagining, which fit Stephenson's theory well.[6]) Among these characteristics:

- Play is voluntary. You cannot be ordered to play; if you are, the activity becomes something entirely different.
- Play is superfluous. It is never a task; "the need for it is only urgent to the extent that the enjoyment of it makes it a need."
- Play is not "real life." It is "a stepping out of `real' life into a temporary sphere of activity with a disposition all its own." It is an interlude in our daily lives.
- Play is secluded or limited. It occurs within limits of time and place; it begins and ends. It is, in many ways, ritualistic: There are rules to the game.
- Play is absorbing. While it is not itself serious, we take it seriously. "Any game can at any time wholly run away with the players. The contrast between play and seriousness is always fluid."[7]

It's hardly surprising that when Stephenson, with these ideas in mind, turned his attention from psychology to communications, he was dismayed to find that the theories relating to media use failed to adequately take into account that reading a newspaper is, well, fun. "What has to be explained about newsreading, fundamentally, is the <u>enjoyment</u> it engenders," he said. "Even bad news is enjoyed in the sense at least that <u>afterwards</u>, upon reflection, we can say that it was absorbing, interesting and enjoyed."[8] [emphasis in original]

Instead, however, what he found was a scholarly world that took itself, and its subject, extremely seriously. While some theorists saw media use as at least potentially pleasurable, the pleasure had a purpose. People like to know what's happening in the world, or they like to escape, or they like to solve problems, or they simply like reassurance every morning that the world has survived another night.[9]

One of the most fully developed theories about media enjoyment came from Wilbur Schramm, who found it "self-evident" that people select news in expectation of a reward. That reward can be either immediate or delayed, depending largely on the type of story, Schramm said. "Crime and corruption, accidents and disasters, sports and recreation, social events, and human interest" news provides an immediate payoff: A reader "can enjoy a vicarious experience without any of the dangers or stresses involved." News of public affairs, the economy, social ills and the like is different; it "requires the reader to endure unpleasantness or annoyance" and is read "so that the reader may be informed and prepared."[10]

Stephenson considered Schramm's view not only inadequate but overly moralistic, based as it was on Freudian pleasure and reality principles, which incorporate the idea that fantasy is a sign of incomplete socialization and cannot produce any real gratification.[11] He turned back to his previous field for insights he found more valuable, and was intrigued by the ideas of psychiatrist Thomas S. Szasz. Szasz viewed "pleasure" as, in part, a communication concept, expressing the idea that the relationship between the people involved is satisfying; nothing further is wanted or needed. Pain, in contrast, is a command for action, for a change in the status quo.[12]

Rather than sticking solely to work by one set of scholars, then, Stephenson preferred to draw on the wide-ranging ideas of Mead, Huizinga, Szasz and others from diverse disciplines and apply them to mass communication. The self and its freedom to choose, he said, are key; "the daily withdrawal of people into the mass media ... is a step in the existential direction, that is, a matter of subjectivity which invites freedom where there had been little or none before."[13] [emphasis in original] Reading the news also has all the earmarks of play, identified by Huizinga. It is voluntary; it is a temporary interlude in the day, satisfying in and of itself; it is absorbing; it is both structured and disjointed, with "the attributes of a game in the rules and self-consciousness it deploys."[14] Moreover, the activity is pleasurable for its own sake: Through reading the news, we gain something. We enhance ourselves. "The self in enlarged" in this process, explained Stephenson. "The person can thrust forward a little for himself, to self-stride."[15]

PLAY THEORY APPLIED TO INTERACTIVE MEDIA

Stephenson had much more to say about play and media use, of course. But this is a good place to end the overview of his ideas and begin to apply some of the ones already mentioned, as well as several others, to the use of a medium with which he was not familiar. When Stephenson died in 1989, interactive media were only just beginning to gain anything resembling a sizable audience. One can only speculate what he might have had to say about the Internet, or a vast news database such as that offered by Nexis/Lexis, or an interactive information service such as Prodigy or America Online. But speculation can be a form of communication pleasure, too.

For starters, one can return to the child's insight that using a computer is, above all, fun. Many adults also seem to view the computer as a toy for grown-ups and commonly describe their use of it as "playing," even when they're actively looking for or retrieving information. Stephenson points to certain media as encouraging a "pure play" attitude (another idea that traces its roots to Mead), with formats and layouts that encourage the reader to browse, to wander, to let himself or herself be unexpectedly diverted or captivated by something new or unusual.[16] Online media, with their almost limitless variety and their capacity to continually modify their content, are naturally attractive for people who find this form of play appealing. One only has to glance at the materials used to market some of these media to see the results of in-house research that has uncovered exactly this attitude. America Online's promotional package urges newcomers to "explore hundreds of services"; the PRODIGY service's "Welcome New Member" screen stresses the joys of exploration and promises "something for everyone."

Moreover, the way we use the medium comprises an inherently playful interaction in and of itself. We hit a key and get a response, a reward, a reaffirmation of our existence and a gratification of our desires. And although we may not know exactly what we're going to get, which can add to our playful attitude of exploration and the pleasant air of mystery involved in news reading, we quickly come to expect that we'll get something; hence our often-unreasonable level of annoyance when a computer bug gets in the way of the instant gratification to which we become so quickly accustomed. Our disappointment and anger may be quite childish, but they are real.

This type of unstructured, exploratory media use corresponds to Stephenson's "primitive" form of subjective play, in which the reader enjoys getting isolated tidbits of news. A more developed type of play -- appealing to a more sophisticated reader, according to Stephenson -- more closely resembles a game, in which the reader is able to pursue his or her "orderly way through a complex subjective minuet." The reader knows where to find things and derives pleasure from the ability to find them, in the same place, every day. In fact, Stephenson says, a newspaper that appeals to this type of game player, but deviates from the rules implied by its regular format and therefore "fails to make it easy for a reader to play easily ... is a spoil-sport."[17] And here, online media encounter some problems.

One of the challenges in developing interactive information services has been to communicate what they contain and help people easily find what they want (or what they may not know they want but might be happy to see if they came across it, a serendipity that's easier in a medium that, say, always puts its international news on Page 3). It is a challenge that has yet to be definitively overcome. In Stephenson's terms, borrowed from systematic psychology, the issue relates to apperception, or the readiness to perceive something in relation to prior interests. The individual, says Stephenson, is "a complex of interests, all active and vibrant, with feelers out all the time ... ready to receive instantly whatever ties in with a prior interest."[18] Certainly, the computer caters to individual apperception, rather than the apperception of a generalized mass audience, in the sense that users can specifically and actively identify what they want to see, as discussed below. But it also poses a related danger. If we don't know what else is available, those "feelers" can easily be stymied.

The fact is that online information has no actual location; it exists in a particular place only upon request. (More on that aspect of personalization in a moment.) Menu structures are the closest approximation of a true location, and online media have used them extensively. However, menus have proved a rather restrictive and cumbersome form of navigation, an attempt to impose the rules of one game -- that of reading a printed page, the same printed page read by thousands of other individuals -- on a different game altogether. Rules better suited to the computer are evolving. It seems likely that the structure people find important will be available, but it will be a structure they choose or even design themselves -- a skill they, unlike their children, may not yet have mastered.

Because ironically, it is to the type of mature reader who is more apt to enjoy a structured game than a bit of pure, unorganized play that online mass media have initially been marketed, largely for the very practical reason that it is this type of person -- better educated, employed in a job that involves computer use, more likely to read "traditional" newspapers -- who has owned or had access to a personal computer. One of the reasons for the relatively slow growth of interactive media through the 1980s may be that their target audience was turned off by the comparative lack of recognizable rules with which to "play" the new game, and that only recently has the diffusion curve for the personal computer begun to extend to those who may find its inherent element of unpredictability more appealing.

But to get back to Stephenson and his theory: If interactive media have a hard time with a structure that will appeal to all the individuals making up a mass audience, they are perfect for a structure that will appeal to a single individual making up an audience of one. When it comes to conscious self-actualization, online services are the superstars of the information business. Stephenson's focus, as an advertising researcher as well as a communications theorist, was on the individual members of a mass audience. He was particularly interested in what he called convergent selectivity, the convergence of one person on one object for sale. In the experience of convergent selection, he said, there is heightened self-awareness: "One is a free man in front of a television set, or with a newspaper in one's hands, to a degree not achieved before by man in his long history."[19] (As an advertising researcher, too, it seems likely he would have been wild about a medium that allows marketers to target and track individuals, not to mention encouraging them to consummate their buying impulse instantly.)

A newspaper comes to your door in a pre-packaged form. It contains what someone else has deemed appropriate. You choose which bits of information to pay attention to; your behavior in reading or watching the news is voluntary and individualistic, elements that distinguish it from the work others require of you.[20] But the range of choices available with any one newspaper or television news program is predetermined and, relative to the choices available through a computer, extremely limited. The person using an online medium has far more decisions to make -- or, as Stephenson would have it, far more opportunities to exercise and enhance the self. Services such as Prodigy contain thousands of information items; databases such as Dialog or communications networks such as the Internet, millions.

Here is the essence of convergent selectivity, the object of which is to let each person choose, thus enriching self-reference and the individual aspects of the self. Convergent selectivity concerns new or non-customary modes of behavior, which give us opportunities to exist for ourselves.[21] Control is in the hands of the individual, who takes a conscious, self-enhancing action to select what he or she wants. (A concept in line with the uses and gratifications theory of communications, of course, though Stephenson goes beyond the somewhat simplistic level of need-fulfillment in an effort to get to the pleasure derived from the act of news reading itself.) In fact, one of the key attributes of interactive media is the user's ability to "personalize" them, to create the most personally pleasing structure out of the nearly infinite possible combinations and arrangements of content. News reading is, of itself, a great skill, Stephenson said, "with which the reader creates his own order, commanding his own grasp of things in the world."[22] The computer makes that skill a necessity.

Not only is the audience member an active participant in the communication process, as visualized by play theory, but without that active participation, there is no communication at all. One has to hit the buttons, and continually make choices about which buttons to hit. Even browsing or exploring requires conscious decision-making and action not required by other media. Here, then, is one of the facets of online media that Stephenson might have found problematic. In his studies of news reading, he identified three basic types of readers. Two already have been described: the reader with a "pure play" attitude, who tends to think of news reading as entertainment, and the more mature reader for whom reading the news is a habitual, structured daily interlude. Stephenson calls the third type a "non-pleasure" reader; this person, if he or she reads at all, has a more utilitarian view of the process than the other two.[23] It may be that forcing readers to consciously narrow their interests and to actively define what they're seeking leads them to see their use of interactive media as a purposeful activity designed to retrieve specific content. They may see it, in other words, as work.

Work, characterized by communication pain, is the flip side of play, characterized by communication pleasure. Work, said Stephenson, is not disinterested. It is not an interlude in the day. It produces things -- goods, services or ideas -- by application of effort for a purpose. It commands effort; it demands that something be done. (Or, in Szasz' words, that relief from a painful experience be provided.[24]) As such, it involves a certain negation of self-existence.[25]

Just as play, communication pleasure and convergent selectivity are linked together, so are work, communication pain and social control, although Stephenson concedes a considerable overlap exists.

Social control, he says, involves ethical needs and moral injunctions; these stem from internalized beliefs and values that are difficult, if not impossible, to change.[26] Interestingly, he uses the formation of public opinion as a "typical" example of social control, an idea whose compatibility with other communications research, from agenda-setting studies to the work of Elisabeth Noelle-Neumann, would make a good subject for future study. In terms of interactive media, the concept opens up the intriguing question of how public opinion is affected by an ability to share one's views with all the other members of an online community. Surely the process becomes more self-enhancing if people feel they are taking an active role in it. Or do online media simply make reference groups more accessible, without diminishing their controlling power to shape individual opinion?

Stephenson's distinction between a mass and a public audience also has potential value here. The latter, he says, is concerned with issues and controversies; the goal of a public meeting is to reach consensus. A mass audience, on the other hand, is made up of isolated individuals with an opportunity to think as they please. Although the message itself may be undifferentiated, what the receiver does with it is personal.[27] Yet the "mass" audience for online media does not really exist. Not only is the medium itself subject to manipulation by each individual, as described above, but each individual also is part of the online community. Anyone can communicate directly with anyone else. If the mass is not isolated, it becomes, perhaps, a public. And the question becomes whether that newly defined public is about consensus or individuality ... or both. Social communication maintains and reinforces social control, Stephenson says.[28] But it is possible that the nature of the social communication is fundamentally altered by a media forum that accommodates individual input, as well as the individual selection of output allowed (to a lesser extent) by more traditional media. Here, then, is an additional issue for study.

Such questions give rise to another of Stephenson's distinctions, this time between communication and information. What earlier studies have missed, Stephenson says, is that communication is carried on in play, with all its accompanying opportunities for self-enhancement. "The communication situation is not one in which information is passed from a communication source to a receiver," he says. "It is one in which the individual plays with communication."[29] The interactivity of online media immediately blurs the line between communication and information anyway; it's even difficult to decide in which category such media belong. Do they deliver information or facilitate communication? Are they mass media or interpersonal ones: Is the flow one-to-many or one-to-one -- or, as online sources proliferate and every user realizes his or her ability to don the hat of a provider of information, many-to-one? Is soliciting comments from a colleague on the Internet a communication function or an information one? How about joining a discussion on an online bulletin board? Even the straightforward process of retrieving a news item involves communication between individual and machine, with all the self-enhancing characteristics of that interaction already described.

Though it's unlikely the developers of online media such as America Online are familiar with Stephenson's theory per se, their market research and, perhaps, their instincts seem to be pushing them toward an emphasis on the communicative aspects of the medium. (Those instincts certainly are supported by the users of interactive media to date, who have gravitated toward their communication functions; however, news and other information sections, on those services that offer them, also have been popular.) They quite rightly perceive those interactive attributes as a key element that differentiates their product from the rest -- a marketing approach with which Stephenson would surely agree.

One other aspect of play theory deserves attention for its potential applicability to online media. With Stephenson's view of the media as elements of socialization and his idea that culture develops in play,[30] one comes full circle back to Mead and his idea about the formation of self and society, and to Huizinga and his belief that play explains civilizations. In fact, Stephenson once wrote that in our "playful" reading of the news as it relates to the formation of culture lay the primary importance of his theory. Truth, he said, is hard to find; the media are buried in their own cultural milieus. Yet our news reading provides the freedom "to see through the cultural conditioning of news. It is not just that he [the news reader] becomes more penetrating in thought, but merely that he can at times exist, as a child does when he freely plays, and thus, every now and then, be free to push to one side the trappings of what everyone else swears is the truth."[31] [emphasis in original]

The computer redefines community, the foundation of culture. Communities of interests -- of, if one prefers, apperceptions -- have become as important to those who use interactive media as communities of place, if not more so. The change can be liberating. It allows people to choose not only what they will see and do in this new community, but who they will be. They can select which online communities to join and even pick a different online persona to fit each one. But as the online existential choices increase (for some memebers of society), the effects on the "offline" world must be kept in mind. Computers make it easier to interact with others who are like ourselves, however we choose to define that similarity -- and to ignore those who are not. In creating one culture through our subjective play, we must be careful not to destroy another.

CONCLUSION

The play theory of mass communication offers both good and bad news for those involved in the development of interactive media. On the one hand, it provides an explanation of why people will want to use these media: They're fun, they're self-enhancing, they're actively involving ... and, as audience demographics change and the children of today become the media users and producers of tomorrow, they're likely to become bigger and better. On the other hand, play theory also highlights problems to be addressed, problems as specific as the way we find a news story and as broad as the way we shape our culture.

In particular, play theory offers insights of vital importance to the journalists who soon will be working in these interactive media but who, for the most part, have been slow to grasp either the challenges or the opportunities the new forms of communication offer.

For starters, journalists need to free their imaginations from the constraints imposed by existing formats and recognize aspects of the audience's use of interactive media that differ from the use of text on a printed page or images on a television screen -- including the inherent "playfulness" of using a computer. Too many of the journalistic ventures into interactive media, particularly those marked by the failures of the mid-1980s, started with the idea of an electronic newspaper -- hence, for instance, the lingering prevalence of cumbersome navigational devices described above. They never progressed to a creative exploration of the unique attributes of a fundamentally different medium. To put it another way, journalists need to play more. They need to recognize the pleasures to be derived from interactive media, then explore what they bring to the party. Journalists must learn how to facilitate and further those pleasures while continuing to serve the public.

In doing so, the journalism community must accept the fact that interactive media will force it to relinquish some control over what is "news" and what goes into the formation of "public opinion." The individual -- the axis around which all of Stephenson's ideas revolve -- will use both the medium and the content it carries in whatever way he or she chooses. But rather than excluding the journalist, this development can and should be seen as a way to bridge the gap between journalist and audience. Instead of mediating between two separate communities -- the newsmaker and the news consumer -- the press becomes a part of a single online community, a participant in the ongoing process of self-actualization. Thinking about the best way to serve a community of which one is an active member entails a different mindset from thinking about a community of which one is a permanent observer but never a participant. Given the well-documented evidence of a growing public dissatisfaction with an aloof and out-of-touch press -- manifested by a steady decline in newspaper readership, among other trends with disturbing implications both for the press and for society -- such a gestalt perceptual switch should be welcomed with enthusiasm by members of the journalistic community.

This development does not mean the press has a less important role in society. It merely means that role is changing. For instance, if one of the strengths of the new medium is the fact that users can personalize it and capitalize on its opportunities for self-actualization, the press must learn to help them do so. In some ways, the media already are showing signs of returning to the community they serve, seeking to understand its needs and find better ways to meet them. The Wichita Eagle project of a couple of years ago is only one example of an effort to made the news process more participatory -- more, as Stephenson would have it, self-enhancing. Interactive media offer unlimited opportunities to extend such forays.

Just two examples may suffice, one in terms of design and the other of content. Concerning the former, journalists must seek ways to encourage both serendipity and structure, accommodating the person who enjoys "subjective" play as well as the one who prefers reliable, recognizable rules to the game. A step in this direction can be seen, for instance, on the PRODIGY service, which offers an enormous range of diverse content but includes prompts in each section to guide users to additional material. On the content side, one option is for journalists to concentrate on being a source of contextual information, so that the choices available to an individual will include not just reports of what happened but informed discussions (to which public, press and policymaker can all contribute) of what the event means to various community constituents.

Journalists, in other words, must continue to be journalists -- better ones, more creative ones ... and more playful ones, at least in Stephenson's self-referential sense of the word. They must be in closer touch not only with the fundamental aspects of what they do themselves, but also with an audience that will increasingly blur the lines among the participants in the media process as control shifts to the individual. Perhaps most important, they, too, must take a lesson from their children: Yes, this is fun.

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(1) *Robert A. Logan*, "Complementarity, Self and Mass Communication." Mass Comm Review, Vol. 18, Nos. 1 and 2 (1991), 27-39: 35.

(2) Bernard N. Meltzer, "The Social Psychology of George Herbert Mead." Center for Sociological Research, Western Michigan University; Kalamazoo, Mich., 1964.

(3) William Stephenson, The Play Theory of Mass Communication. Transaction Books; New Brunswick, N.J., 1988: 64. (Original edition published 1967, University of Chicago Press Ltd.)

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(5) Johan Huizinga, Homo Ludens: A Study of the Play Element in Culture. The Beacon Press, Boston, 1955: 3-5 (Original English edition published 1950, Roy Publishers, London.)

(6) Brian Sutton-Smith, "Introduction to the Transaction Edition," The Play Theory of Mass Communication (1988 edition): xi.

(7) Huizinga: 7-11 (covers all bullet points)

(8) William Stephenson, "The Ludenic Theory of Newsreading," Journalism Quarterly, Vol. 41, No. 3 (Summer 1964), 367-374: 368.

(9) Ibid: 367.

(10) Wilbur Schramm, "The Nature of News," Journalism Quarterly, Vol. 26, September 1949, 259-269: 260-261.

(11) Stephenson, Play Theory: 52-53.

(12) Thomas S. Szasz, Pain and Pleasure: A Study of Bodily Feelings. Basic Books Inc., New York, 1957: 203.

(13) Stephenson, Play Theory: 45

(14) Ibid: 150; and Stephenson, "Ludenic Theory ...": 370.

(15) Stephenson, Play Theory: 159.

(16) Ibid: 151.

(17) Stephenson, "Ludenic Theory ...": 369, 371.

(18) Stephenson, Play Theory: 149.

(19) Ibid: 35.

(20) Ibid: 193.

ENDNOTES, continued

(21) Ibid: 2.

(22) Ibid: 158.

(23) Ibid: 157; see also Stephenson, "Ludenic Theory ..."

(24) Szasz: 87.

(25) Stephenson, Play Theory: 193-194.

(26) Ibid: 65, 2.

(27) Ibid: 33-34; 39.

(28) Ibid: 44.

(29) Ibid: 151.

(30) Ibid: 195.

(31) Stephenson, "Ludenic Theory ...": 374

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A Theoretical and Normative Approach to National Information Infrastructure Policy

This paper relies on critical theories of technology and democratic discourse to develop normative communication principles for the development of the National Information Infrastructure. This theoretical analysis suggests that efforts to privatize management of the information highway, which are currently underway, undermine the network's long-range potential to encourage public discourse and democratic participation.

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A Theoretical and Normative Approach to National Information Infrastructure Policy

On September 15, 1993, after nine months in office, the Clinton Administration's Information Infrastructure Task Force (IITF) released its first major report on the information superhighway. "The National Information Infrastructure: Agenda for Action" (IITF, Sept. 15, 1993) laid out the Administration's long-term policy objectives for the telecommunication and information services industries. It also represented a first down payment on the new information age campaign promises of candidate Clinton.

The "Agenda for Action" promoted private investment in a National Information Infrastructure (NII), a telecommunications web that would eventually permit interactive transmission of text, data, voice, and video communications throughout the country. The second major theme of the initiative was to "Extend the 'universal service' concept to ensure that information resources are available to all at affordable prices." (IITF, Sept. 15, 1993, p. 3)

These two themes of privatization and universal service are not new to the telecommunications industry. They were emphasized during the final stages of diffusion and monopolization of the telephone, a technology that delivered essentially a new service--conversation without face-to-face contact (Horowitz, 1986). But unlike the telephone, which provided a service that was previously unmarketed and undeveloped, the National Information Infrastructure promises to offer a host of services--video, phone, data transmission, printed texts--that have already been developed through private and public investments. In addition, the NII is being developed in an era of telecommunications deregulation, making it unlikely that politicians will embrace the type of monopolistic common carrier structure that dominated telephone communications from the 1920s until the current wave of deregulation broke up AT&T in 1982.

Thus, even as it is being developed, the usage, structure, and costs of the information highway are still open questions. Exactly what contents will eventually be delivered over the technological pathways, in what forms, by whom, for what purposes, and at whose expense represent some of the great communication technology and policy questions of our time. Government forecasts suggest that the NII will be constructed primarily with private funding, but that it will serve public interests. Yet, private money and public interest can be strange bedfellows that may sometimes come together, but are not necessarily permanent partners. Indeed, if the network is fully privatized, the NII may come to look more like a private tollway than an information superhighway--a development that would place financial barriers on the use of the system by less affluent citizens.

In recent years there has been a renewed call (Avery & Eadie, 1993; Gomery, 1993; Noam, 1993; Rowland, 1993) for scholarship that influences communication policy. This call pushes communication scholars to move beyond the safety of historical analysis into the far more speculative and partisan realm of forecasting and policy formation. The questions surrounding NII development are so big, and the technological and institutional interests involved in the NII are so complex, that the subject is daunting. Yet, leaving the policy debates over new technological developments strictly to the proponents of economic forces, power politics, and technological determinism would amount to an abdication of scholarly interest in ethical communication structures and democratic institutions.

This paper relies on critical theory of technology and democratic discourse to develop normative communication principals for the development of the information highway. The analysis suggests that the rush to privatize the NII, which is currently underway, undermines the system's long-range potential to enhance democratic participation through public dialogue and decision making.

Macro Theory on the Use of Technology in a Democracy

Common sense tells us that technologies are neutral or instrumental artifacts that can produce a variety of outcomes. But more than four decades ago Innis (1951) theorized that communication media were inherently biased, and that their development and utilization produced macro effects. According to Innis, technologies privileged particular ways of knowing the world, thereby shaping the social relationships, values, and hegemonic outcomes of the cultures that used them. The development of communication technologies and the development of empires went hand-in-hand. Ellul (1964) described the impact of technology as both biased and expansive. He saw technological development as one of the driving forces that shaped society. Because of the often revolutionary and disruptive effects of mechanization, both Ellul and Innis questioned equating the development of technology with progress or social advancement.

McLuhan (1964) built upon Innis' and Ellul's ideas, but McLuhan believed that technological advancement would reduce alienation and make the world into a "global village." His popularly marketed theories emphasized the formal characteristics of communication technologies over their content and rhetorical effects. McLuhan claimed that each new technology forced its users to adopt certain practices and a particular way of viewing the world. As a technology becomes more ubiquitous, so did the ways of acting, behaving, and thinking that it required. In this way, conforming to the extensions of man shaped the visions and day-to-day lives of humans. Unlike his predecessors, McLuhan reveled in the communal and interactive potential of future electronic communications, believing their formal characteristics would lead to a better way of life.

Without disregarding the importance of content or the functional limitations inherent in various media, Williams (1974) described the development of communication technologies as being contingent upon structural and historical forces.

His ideas were premised on the belief that technologies are not discovered, but invented. Specific groups deliberately invested in communication systems for their own instrumental purposes. Williams saw nothing neutral about the process of development and diffusion. Groups that have power design technologies that will enhance their power. Sometimes a technology might be coopted by a group that was not directly involved in its development, but reapplication of a technology required effort and resources much like those invested in a technology's initial development and diffusion.

Poststructuralist and postmodern theorists (e.g.: Fiske, 1986) undermined such content-focused, formalist, and structuralist theories of media development. Postmodern analyses of high and more ubiquitous popular culture texts suggest that the representations, contents, and meanings of their messages are malleable. Thus, with some effort, readers and writers can produce subversive and liberating accounts from the texts of nearly any medium. In this sense, empirical reality and textual cannons are viewed as ideological puzzles which can be rearranged, reworked, and appropriated by anyone capable of critical analysis. In the minds of postmodern thinkers, empirical reality, historical artifacts, and texts of all kinds become the building blocks for radical analysis and interpretive revision. This process de-emphasizes the coercive potential of particular contents, structural media formations, and technological characteristics. It suggests that democratic discourse will occur regardless of the structural and content restrictions placed on media technologies.

However, Jameson (1987) characterizes much postmodernist work as a reaction to high modernism. He maintains that such reactions will not achieve their full humanizing and liberating potential until they are seen in a historical, rather than a transcendental, light. Thus, Jameson has historicized postmodernism and recuperated it into a broader notion of the modern project. In doing so, he rejects the old concept of modernism which sought to revolutionize knowledge by discovering universal natural laws and timeless empirical truths. Instead, he argues for provisional truths which are based on a particular historical vision of a utopian, or better, society. That culturally and temporally bound vision enables truths, goals and norms to be posited and evaluated. But for an evaluative democratic dialogue to take place, the participants must have some recognition of their place in society and history--they must have a sense of historical consciousness.

Latour (1993) attacks not only the notion of postmodernism, but modernism as well, when he claims that there has never been a historic rupture in our use of technology or knowledge. While people who describe themselves as modern view the explosion of scientific knowledge and technology as creating a revolutionary break with premodern cultures, Latour claims that humanity has never been modern in that sense. Instead of believing in scientific inquiry and technology as mechanisms for achieving objectivity, he maintains that our scientific networks of machines and social relationships have guided how we looked at ourselves, nature, and technology. The often convoluted practice of science and technological development has enabled us to make distinctions and move toward shared understandings about ourselves, technology, the natural world, and history. But for Latour all these things are network bound. The spread of science and technology is not so much dependent on their truth value or rationality as on scientific society's ability to produce networks of ever increasing speed and scale.

Although he does not use the term "network," Feenberg (1991) too suggests that technological development fundamentally changes human understanding and social relationships. But Feenberg is more interested in political and social change than he is in merely describing the present situation. He maintains that technological networks in the United States have been designed and managed by administrative and technical experts, who generally cater to the interests of property and wealth. Feenberg recognizes that the private system is clearly preferable to the communist system, which consolidates managerial, technical, and political control in the hands of a party or state bureaucracy. But within the somewhat regressive private-capitalist model, the majority of technological development is geared toward the production of profits and the reproduction of a capitalist dominated system of ownership, management, and control. Proponents of this system describe technology in apolitical terms and view it as rational because it leads to more "efficient" modes of production. Feenberg acknowledges that this system has alleviated many of the worst industrial ills that were associated with Nineteenth Century capitalism, such as child labor. It has produced a society in which goods and services are increasingly more plentiful and available to the general population. For this reason, technological development is often viewed as a worthwhile and progressive undertaking in and of itself. This perspective embodies the capitalist ideological stance toward technology.

But Feenberg notes that technological innovation has also functioned to divide the members of capitalist industrial societies into two groups. One group is made up of intellectually skilled managers or technical experts, while the other group contains much larger numbers of deskilled and less valued laborers. As Marx predicted, the managers and experts run the system in their own interests and those of their capitalist benefactors. This system has turned many of the craftsmen and artisans of the past into the alienated and deskilled workers of the later Twentieth Century. It has helped to produce an apathetic and pessimistic workforce whose interests are increasingly undermined by the introduction of new, labor-saving technologies. By taking this social dimension into account, Feenberg critiques both capitalism and the type of technological innovation it breeds. He accuses capitalist innovation for stunting both human potential and undermining democratic practices.

Because he acknowledges the non-democratic benefits of technology, Feenberg does not retreat from technological development. Instead, he has put forth a Marxist-grounded social-democratic model of technological development which advocates seizing opportunities for transforming the social and political dynamics of the society. His transformative model requires that workers exercise far more democratic control over the management of their labors--including the administration of production processes and the development and introduction of new technologies. This bottom-up model is also much closer to the democratic management model used by contemporary professionals. It calls for reskilling workers in terms of their administrative and technical capacities, as well as their ability to participate in a self-governing dialogue. Feenberg notes that the introduction of increasingly complex large-scale networks, which must address a multitude of competing interests as well as the coordination of many workers with a wide variety of skills and expertise, presents unique opportunities for transforming the role of technology in industrial societies.

At this point in the political and social evolution of capitalism--when administrative control is frequently rationalized in terms of free market ideologies, deregulation, and private investment--an alternative model for constructing technological networks and industrial production processes needs to be explored. Rather than developing a communication network that conforms to the demands of private investment, a publicly funded and controlled NII might be far more capable for supporting public discourse and democratic decision making. The premier features of such a public system would be its accessibility and its accountability to publicly determined goals. Such a publicly controlled system would not be judged merely on its ability to stimulate commerce and profits, but on its ability to stimulate democratic dialogue and citizen participation.

Creation of an information superhighway that was responsive to such public needs could even provide a model for developing new technologies along increasingly progressive lines. However, when viewed in terms of public versus private development, history suggests that the public strategy would not be easily realized. Indeed, it is not even apparent which communicative goals and normative principles would best encourage public discourse and democratic processes.

Communication Norms and Democratic Practices

Hallin (1985) cites the Frankfort School of critical theorists--Horkheimer, Adorno, Marcuse, and Habermas--as recognizing that although capitalism brought about the rise of the public sphere, more contemporary capitalist societies appeared to have been incapable of supporting the type of dialogue and collective self-reflection that public life presumes. The Frankfort School theorists claimed that capitalism facilitates rational and purposive--technical and administrative--behaviors which inspire practical solutions to material problems. But capitalism in the United States does not encourage the type of public discourse over purposes that would guide citizens toward a better society. The society was adept at implementing technical means, but it was not able to consider and determine the all-important ends of social life.

Gouldner (1976) notes that the privately owned communication media characterize themselves as nonideological because they deal almost exclusively with technical or managerial questions. There is very little public debate over the purposive goals of society. Carey (1987) claims that when people have to debate and make decisions in public they can not be ruthless because they must adopt a broader frame than their own narrow interests. This is the value of having a healthy public life. Carey maintains that the public sphere can be the place, apart from government and private interests, where compromise and consensus building occur. It is the place where private individuals could meet on equal terms to transcend their private interests in the process of self-improvement and self-government.

Woodward (1993) draws upon the work of Charles Taylor, when he describes self-knowledge as a normative goal of communication. In order to become self-aware, individuals must participate in a public dialogue that forces them to constantly re-orient themselves as members of their community. Coming to know oneself as part of a social structure is the key to self-knowledge and human growth. "Active personal expression" is the primary way that individuals attain self-knowledge and historical consciousness.

Gouldner (1976) suggests that traditional societies foster cultural understandings though interpersonal interactions. These face-to-face relationships are based on feedback and dialogue which lead to common understandings and shared goals. Ball-Rokeach and Reardon (1988) note that contemporary mass mediated communication does not permit the type of feedback and dialogic participation experienced in interpersonal communication. They distinguish between monologic communication, which is evident in mass communication and public speaking, dialogic communication, which is a characteristic of interpersonal encounters, and telelogical communication typically found in new telecommunication technologies. Telelogical communication uses print, speech, and nonverbal gestures interactively to communicate over long distances via electronics. However, the degree of interaction and personal expression permitted in telelogical communication networks can vary greatly. Indeed, choosing channels or voting for preferred candidates or positions could be construed as interactive feedback, but they require a manifestly different level of participation than that found in interpersonal conversations.

Woodward (1993) cites the work of Charles Taylor, who believed communicative choice could not replace "active personal expression" as a means of achieving self-knowledge. Individuals must be able to communicate and fully elaborate their positions to achieve personal growth. This approach has ramifications for new "interactive" technologies which may only permit the user to exercise a limited range of response options. Such options are often closed-ended rather than open. To the extent that they are limited and closed, the options do not facilitate intellectual synthesis and dialogic expression. Therefore Woodward concludes that technologies should be critically assessed to determine whether the technologies encourage users to come to grips with "the concrete, historically-specific circumstances in which dialogue, personal meaning, and self-knowledge . . . flourish in their full complexity" (Woodward, 1993, p. 173).

Complexity and a lack of coherent contents and structure have limited the democratic utility of the monologic and privately controlled mass media. Newspapers, television, and most popular media in the United States fit this model. In the early part of the Twentieth Century, Lippmann (1922) noted that the fragmentary hard news stories in newspapers were used by only a few knowledgeable elites. These elites ran industry, set the policies, and governed nations. The vast bulk of newspaper readers were excluded from public life, and were even too apathetic to pay the full price for such costly information. As a result, news values were driven by advertisers who subsidized the costs of news production and distribution. In turn, the advertisers demanded entertaining stories and short sensational fragments that attracted large circulation figures.

Lippmann's (1922) work foreshadowed the Frankfort School's criticism of the cultural apparatus and consciousness industries. The newspaper had been expected to arm the public so that its members could govern themselves, but that promise had not come to fruition. Instead, the public sphere had given way to the privately controlled mass media, which shaped consciousness and disseminated a deeply embedded structure of domination. The consciousness inspired by the popular media was one-dimensional, its function was to sell products to consumers, not provide critical contents for democratic action. The Frankfort School critics claimed that the societal norms of involvement and growth were undermined by the commercial media's promotion of a passive, apolitical, consumer lifestyle. The subsidized "free" commercially messages pushed public sector media to the margins of the society.

More than any other medium, television exemplified this domination of the commercial sector over the weakened public sector.

Finally, Christians (1989) emphasizes the value of "cultural continuity" during periods of great technological change. He maintains that technological advancements do not necessarily lead to social progress. According to Christians, it is imperative that less industrialized cultures be encouraged to evolve and adjust to technologies in ways that are not destructive to their time-proven social structures. Although technological diffusion and some discontinuities are inevitable, technologies that drastically undermine existing institutions can cause major cultural discontinuities and destroy the social fabric of a society. Therefore, technologies must be developed and introduced in such a way so that cultural continuity is maintained.

The question then becomes, which norms would be most appropriate for the development of the information highway? Based on that discussion, adhering to the following list of normative structural, content, and performance criteria would help ensure that the National Information Infrastructure served the ends of public dialog and democratic participation.

1. The NII should be accessible to all citizens. Like the old town square, it ought to be a space where public--taxpayer-funded--information can be obtained without financial or technical barriers.
2. Private citizens need to be encouraged to express themselves, not only through primitive feedback options, but through complex interactive communications. In this regard, the information highway should enable citizens to communicate their own complex personal understandings, including messages about their history and their ideological perspectives.
3. The NII should be managed by citizens and its users. This would contribute to the democratic development of the system, as well as provide a

mechanism for those who are personally interested in its development to better shape the system to meet their needs.

4. The highway must not be usurped or even so heavily saturated by commercial messages that it becomes difficult for citizens to communicate noncommercial contents through the system. As a public forum the NII should permit individuals to express their interests and modify them in public debate. To ensure this, distinctions will need to be made between those channels available for personal messages, publicly funded messages, and commercial speech. If the NII is to encourage democratic discourse and historical consciousness, there needs to be both separation and points of exchange between the three separate structural forms.

5. The public and personal channels should have "common carrier" status--the state or private managers should not exert control over the contents and messages transmitted via the NII. Nor should the costs of using the channels be prohibitive for individual citizens. Placing the highway under the management and expertise of private corporations would only limit the system's potential to encourage democratic dialogue.

6. The new technology should allow for cultural continuity. Key democratic institutions, like public libraries and schools, should continue to play important roles in the society. The NII must not annihilate the current culture, or render it arcane and outmoded. Our ability to see ourselves within the flow of history should be enriched, rather than undermined, by the information highway.

Conclusions for Telecommunication Policy

A recent Information Infrastructure Task Force (IITF) report suggests the extent to which the U.S. Government is currently looking to private industry to develop the information highway.

> Private industry will be responsible for virtually every major facet of the NII and the information marketplace it creates. Private industry will build and manage the networks, provide the information tools and much of the information that travels the networks, and develop the many of the application that use the networks. (IITF, Jan. 25, 1994, pp. 1-2)

Estimates of private expenditures for the NII, which range from $35 to $100 billion annually throughout the next decade, are premised on private investors' excitement over the delivery of a variety "new" services, including video phone, entertainment television programming, video-on-demand, home shopping, home banking, remote health care, direct-response advertising, and home gambling services (IITF, Sept. 15, 1993, p. 6; Stern, 1993). Private investors will be most interested in those services that can quickly turn a profit, particularly entertainment programming, interactive shopping, financial services, and electronic gambling. Unfortunately, these services are not likely to increase public enthusiasm for democracy or generate public discourse.

Federal outlays for 1994, which amount to roughly $2 billion (IITF, Sept. 15, 1993, p. 24) are primarily directed toward developing the infrastructure over which these supposedly revolutionary applications will be delivered. Applications that were less likely to led to profits, such as education, health care services, local and national government announcements, law enforcement messages, and the utilization of government-wide E-mail, were allocated only $150 million in the Clinton Administration's 1994 budget.

But restating these meager public investment projections fails to acknowledge the far more substantial public investments that have been allocated to NII development. The Internet--an interactive prototype network of networks that now has millions of users in the United States--was developed through public funding. The Federal Government has also allocated large amounts of money to the development of high performance computers and telecommunication technologies. State and local education districts have invested billions annually in computer literacy programs in public schools. Indeed, much of the funding for the Internet and computer development has already been initiated by the Department of Defense or other governmental agencies.

In light of the complete array of research efforts and applications funded with public revenues, it is more accurate to suggest that public funding has played the leading role in the development of information highway technologies. Failure to acknowledge this massive public investment overstates the potential role of private investment. This lack of perspective could enable private companies to claim most of the benefits of NII development while paying only a fraction of the system's true costs. Because the majority of the total expenses for the information infrastructure will be contributed by taxpaying citizens, they should have the opportunity to exercise managerial and technical control over the system. The structure of that citizen control should be hands-on and user oriented. Citizens would be fully involved in the design and management of the system. This notion of citizen control would extend far beyond the current use of citizens' advisory councils made up of corporate executives or the oversight duties of elected officials. Tests of "interactive governance," in which citizens use electronic bulletin boards to comment on proposed government activities, should be elaborated into even more interactive and direct forms of public discussion and governance.

The issue of control is crucial because it will affect the structure and possible applications of the system. Seemingly subtle technological differences can have major implications. Reinhardt (March, 1994) notes that the ratio of upstream to downstream bandwidths will ultimately bias the system toward either a consumption or communication model. A system that has higher downstream bandwidths would be designed primarily for monologic applications. It would permit only limited interactivity--the end users would be granted only minimal status as message producers. In contrast, a system that had roughly equal upstream to downstream capacity would permit full two-way communication that made all users full communicators.

The information highway's relationship to traditional public institutions is also critical. The extent to which NII technologies are applied to education will be influenced by various levels of managerial and technical decision making. Other network-related appropriations policies will also influence the overall nature of the system. For generations libraries and archives have been maintained at public expense. Many of the materials that have been housed in these institutions are now in the public domain--they are cleared of all copyright claims making them available for copying and reuse. Making it possible to deliver historic library and archival material over the NII would require an investment in two areas. First, the materials themselves would have to be digitized before they could be sent over the information highway. Second, an electronic locating system would have to be developed so users from many sites could locate materials. If these tasks were left to private industry, only the most in-demand and well known historic materials would be available at costs affordable to average citizens. Much of the richness of our historical record would not be available to ordinary citizens over the information highway. Therefore, this decision would reduce the discursive potential of the system at the same time that it minimized the professional role of public librarians and archivists in the processes of collecting, preserving, and disseminating our historic and artistic records.

In conclusion, the theories of technological development presented in this paper suggest that NII management and technical decision making should be subjected to the most democratic scrutiny and analysis. This is important because policy formation with regard to the NII will do more than determine the economic structure of this particular communication channel. The information highway promises to be our major communication network in the decades to come, and the policies shaping it will also influence who we are and what type of democratic activity is possible. Because the political and social ramifications of current NII policies promise to be so significant, the broad theoretical implications of those policies deserve far more public scrutiny and debate than they are presently receiving.

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